3-18-2020

Idaho First: How Archaeological Discoveries on the Lower Salmon River Change Our Perspectives on the Peopling of the Americas (Slides)

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KEYSTONE ARCHAEOLOGICAL RESEARCH FUND

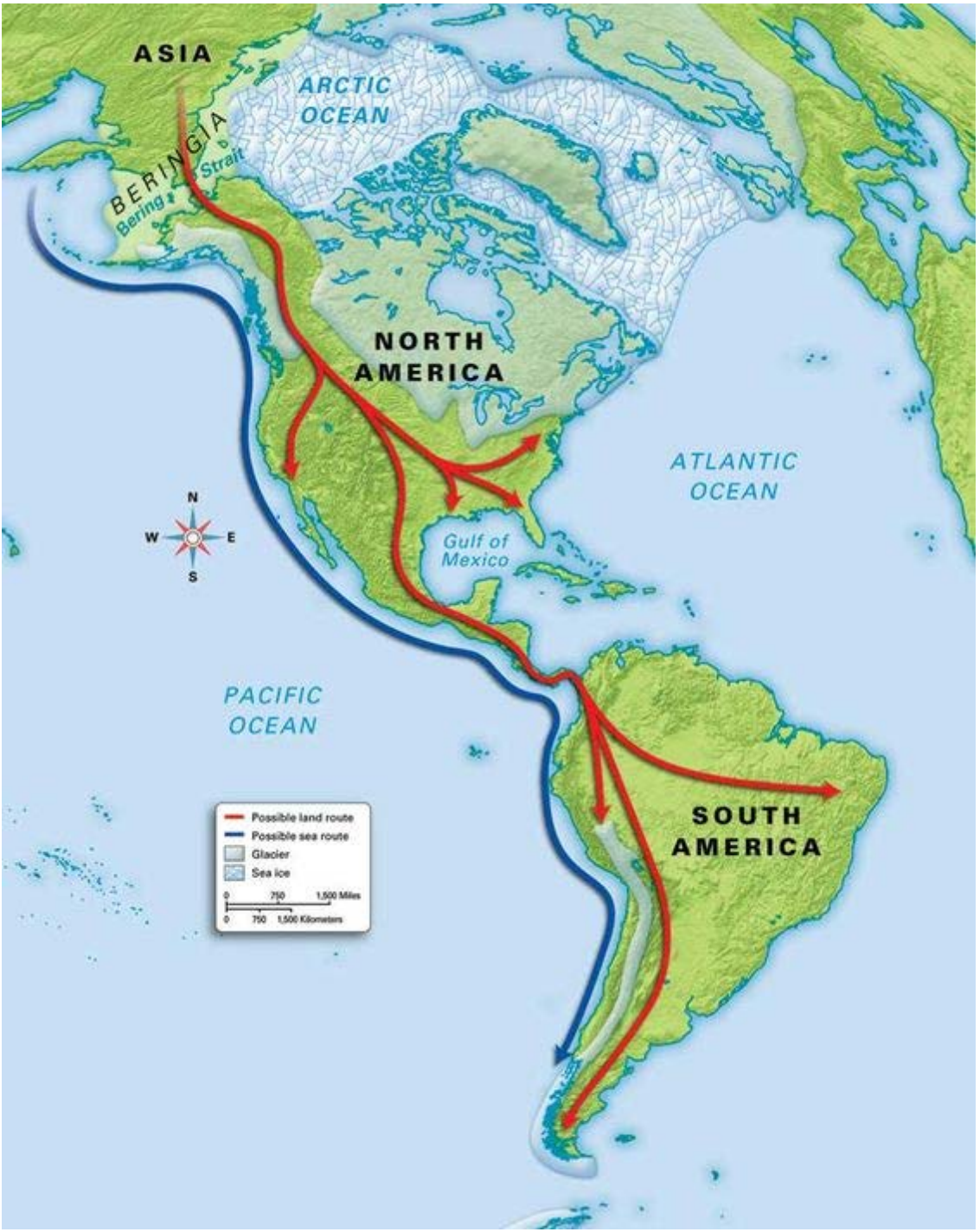
Science
AAAS

RESEARCH Davis *et al.*, *Science* **365**, 891–897 (2019) 30 August 2019

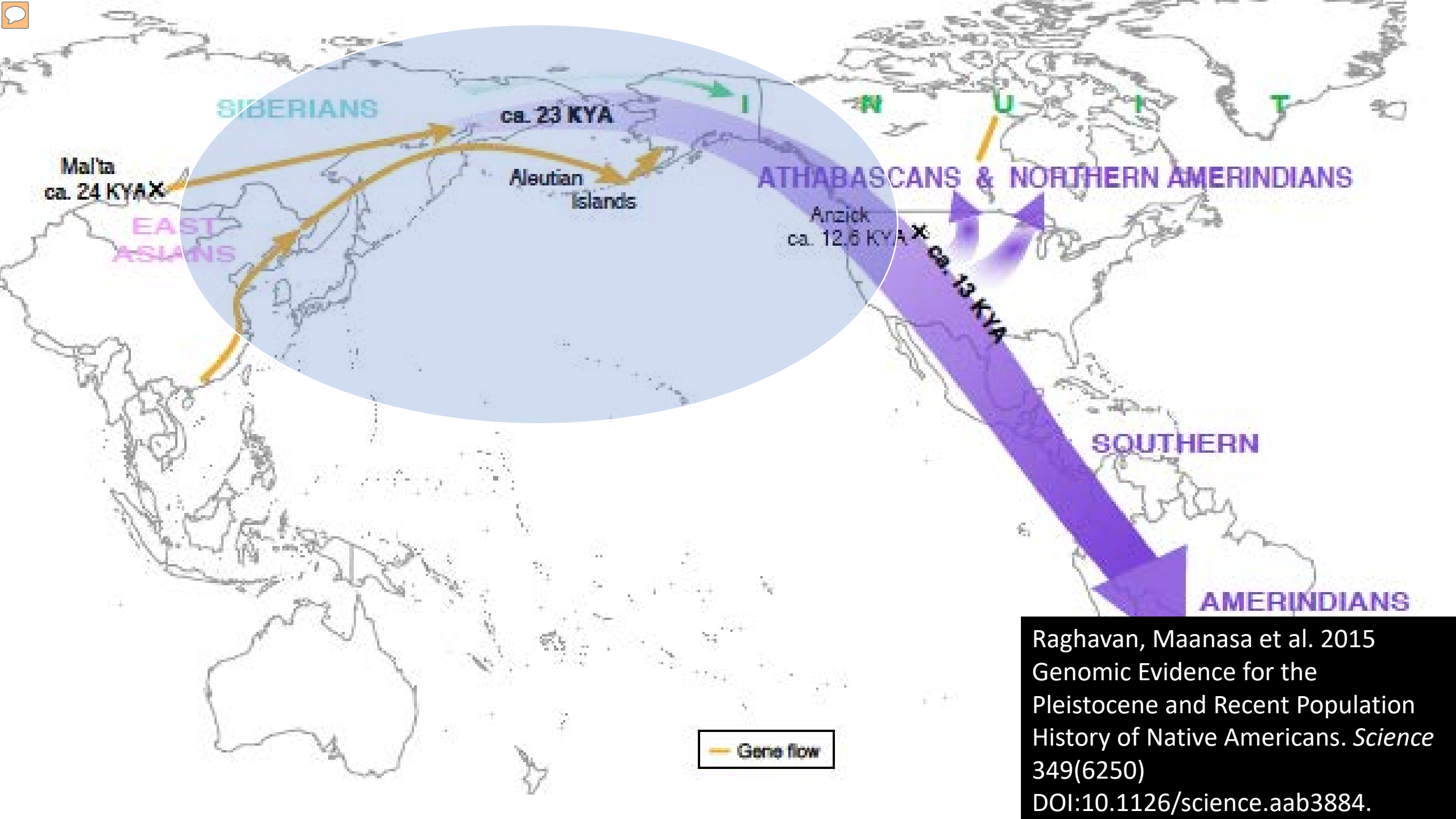
ARCHAEOLOGY

Late Upper Paleolithic occupation at Cooper's Ferry, Idaho, USA, ~16,000 years ago

Loren G. Davis[1]*, David B. Madsen[2], Lorena Becerra-Valdivia[3], Thomas Higham[3], David A. Sisson[4], Sarah M. Skinner[1], Daniel Stueber[5], Alexander J. Nyers[6], Amanda Keen-Zebert[7], Christina Neudorf[7], Melissa Cheyney[1], Masami Izuho[8], Fumie Iizuka[8,9], Samuel R. Burns[1], Clinton W. Epps[10], Samuel C. Willis[11], Ian Buvit[1]



What does it all mean?

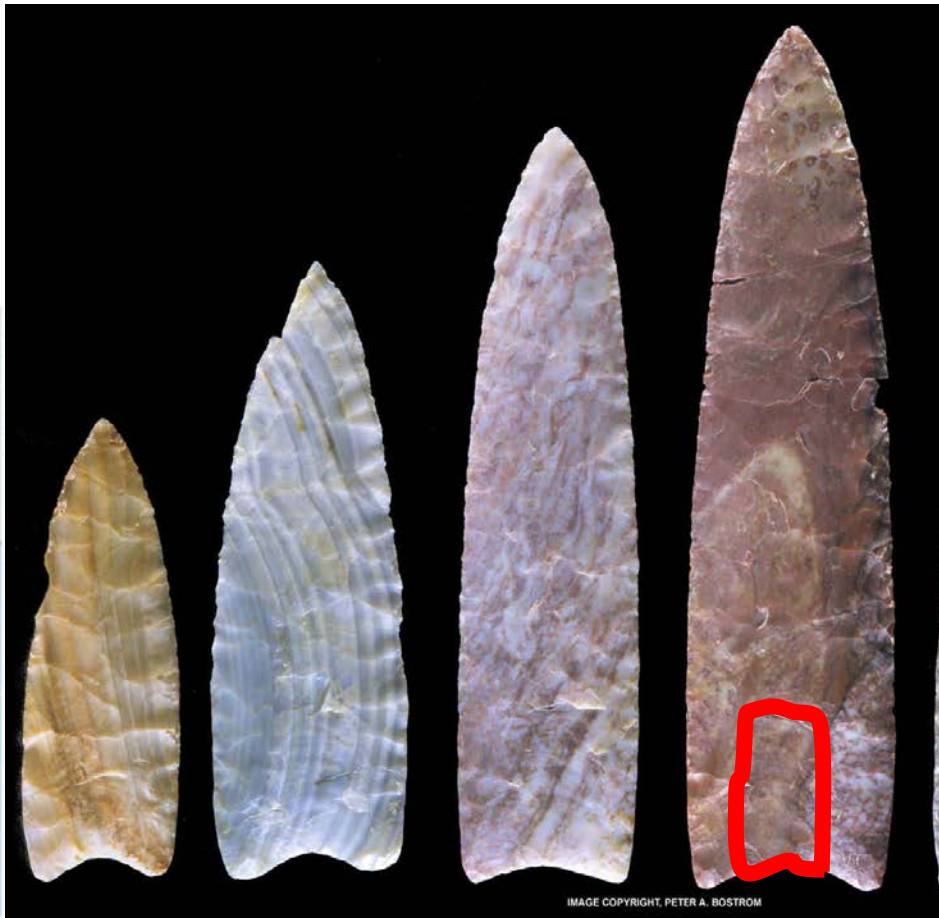


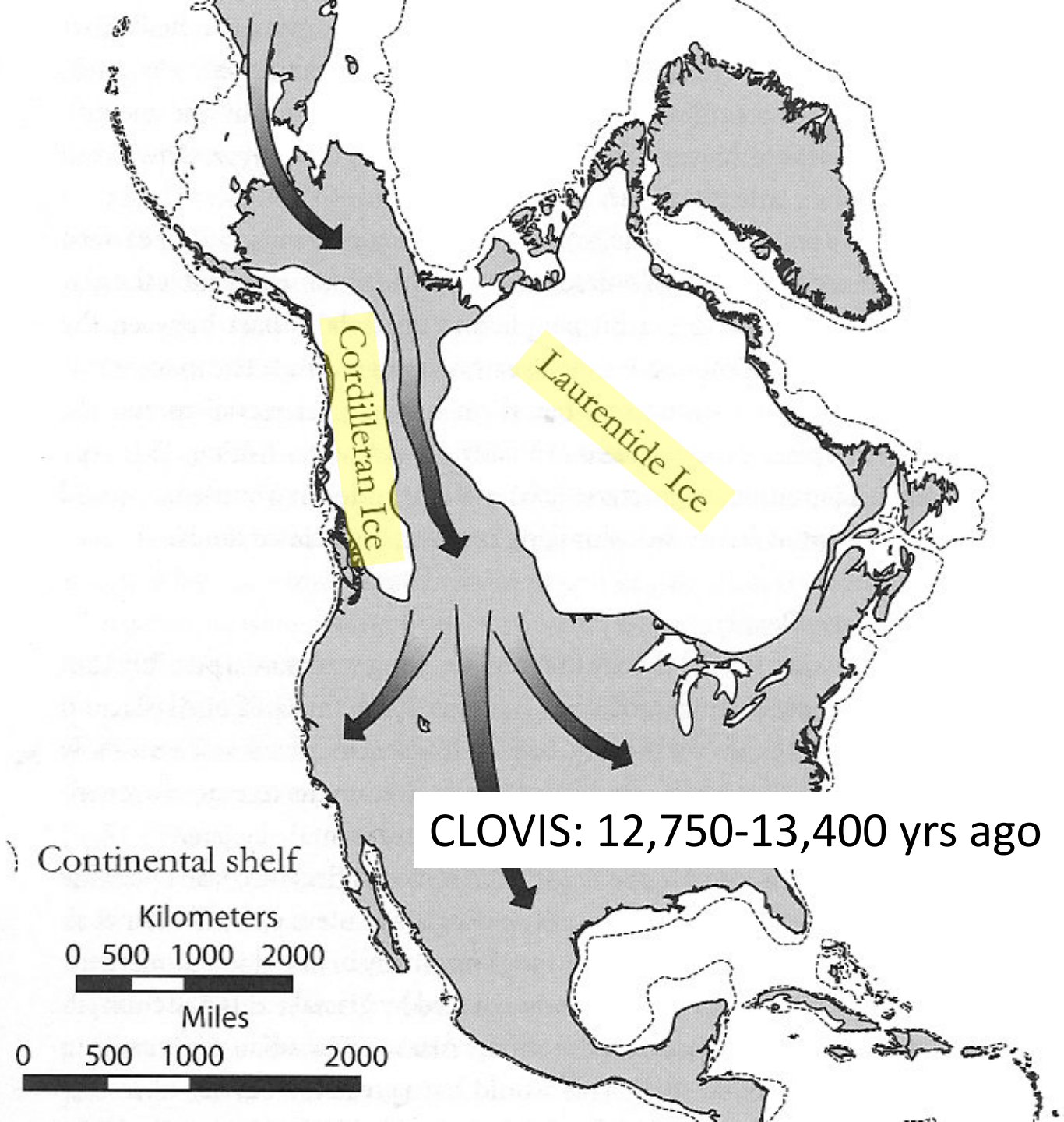
Raghavan, Maanasa et al. 2015 Genomic Evidence for the Pleistocene and Recent Population History of Native Americans. *Science* 349(6250) DOI:10.1126/science.aab3884.

Peopling of the Americas Debate

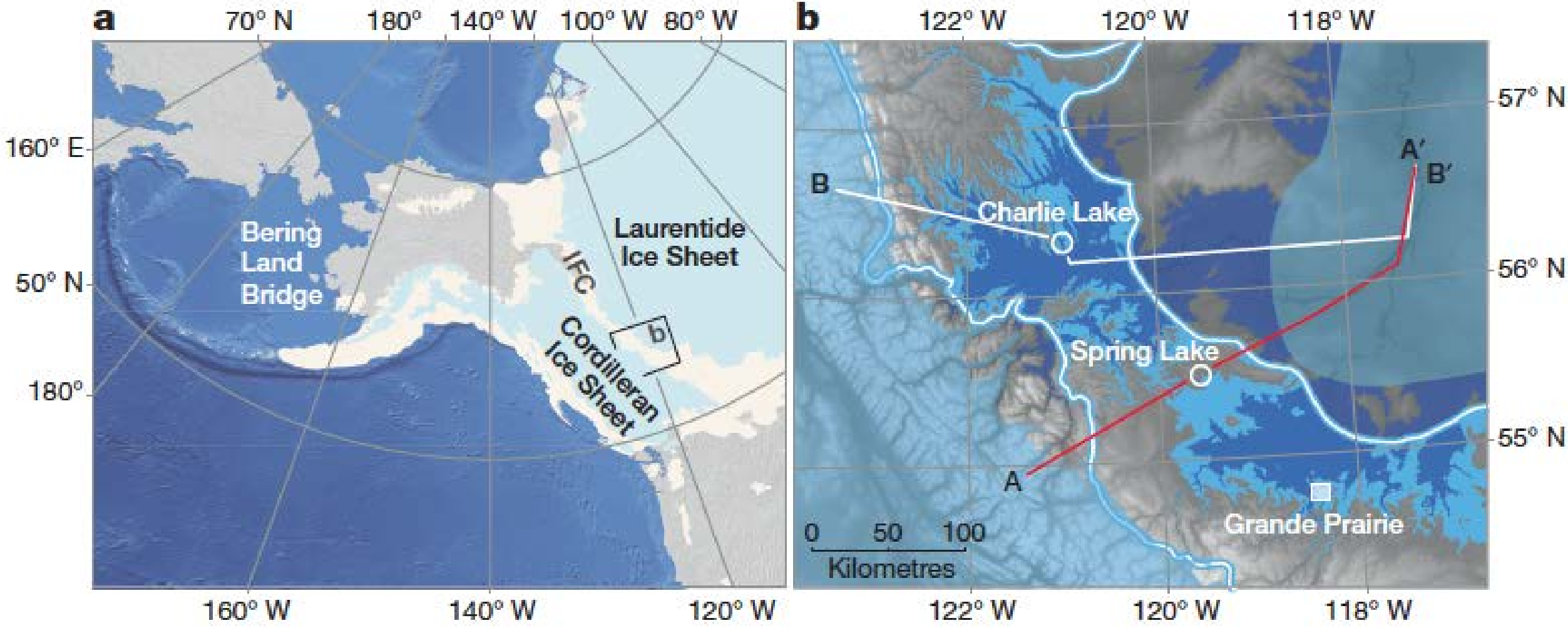
- **Traditional model (Clovis First)**
  - Initial migration from NE Asia at high latitudes
  - Upper Paleolithic peoples occupy eastern Beringia and move south via interior route
  - Clovis Paleoindian Tradition appears after 13,300 years ago

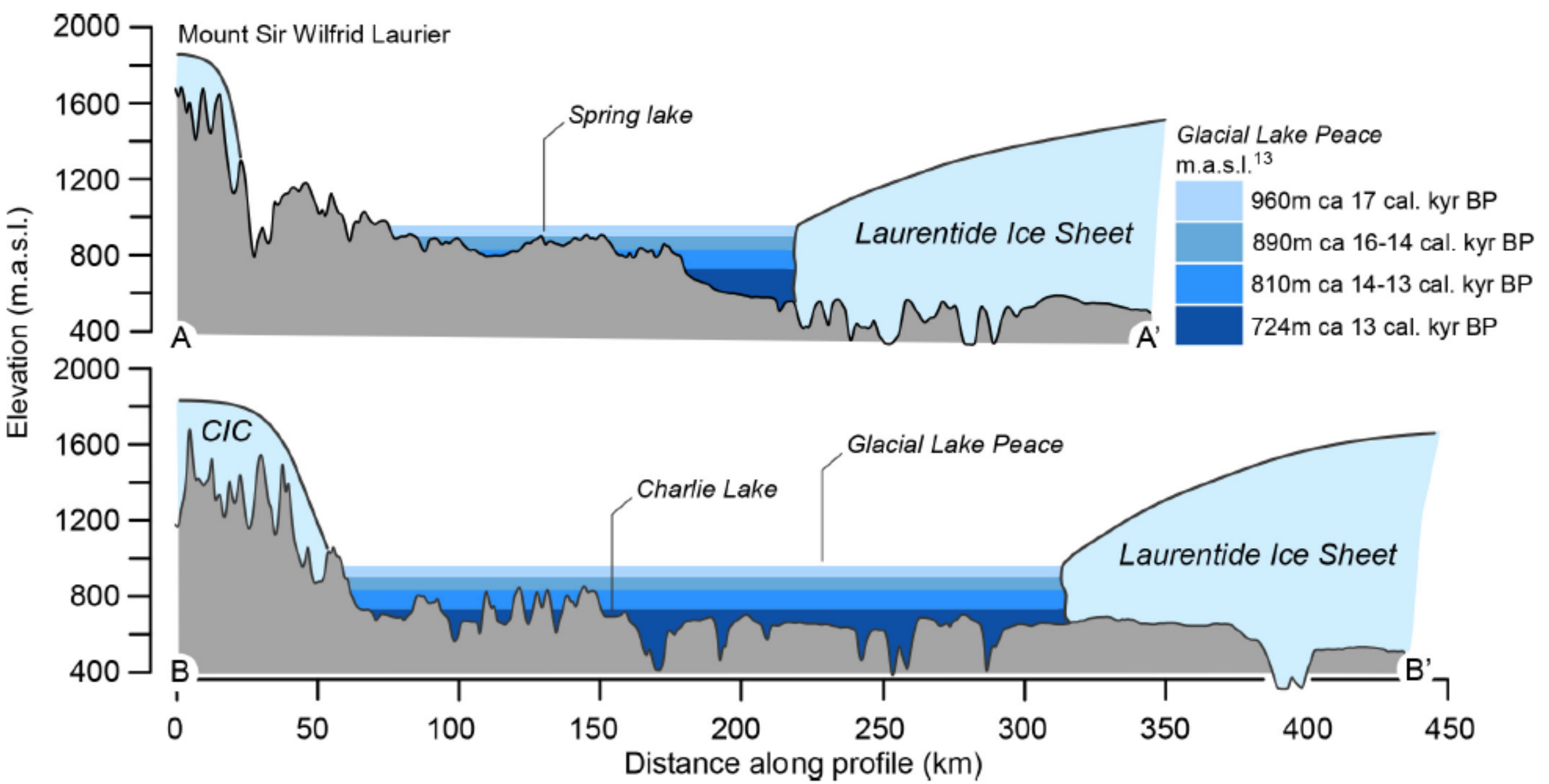
CLOVIS PALEOINDIAN FLUTED SPEARPOINTS



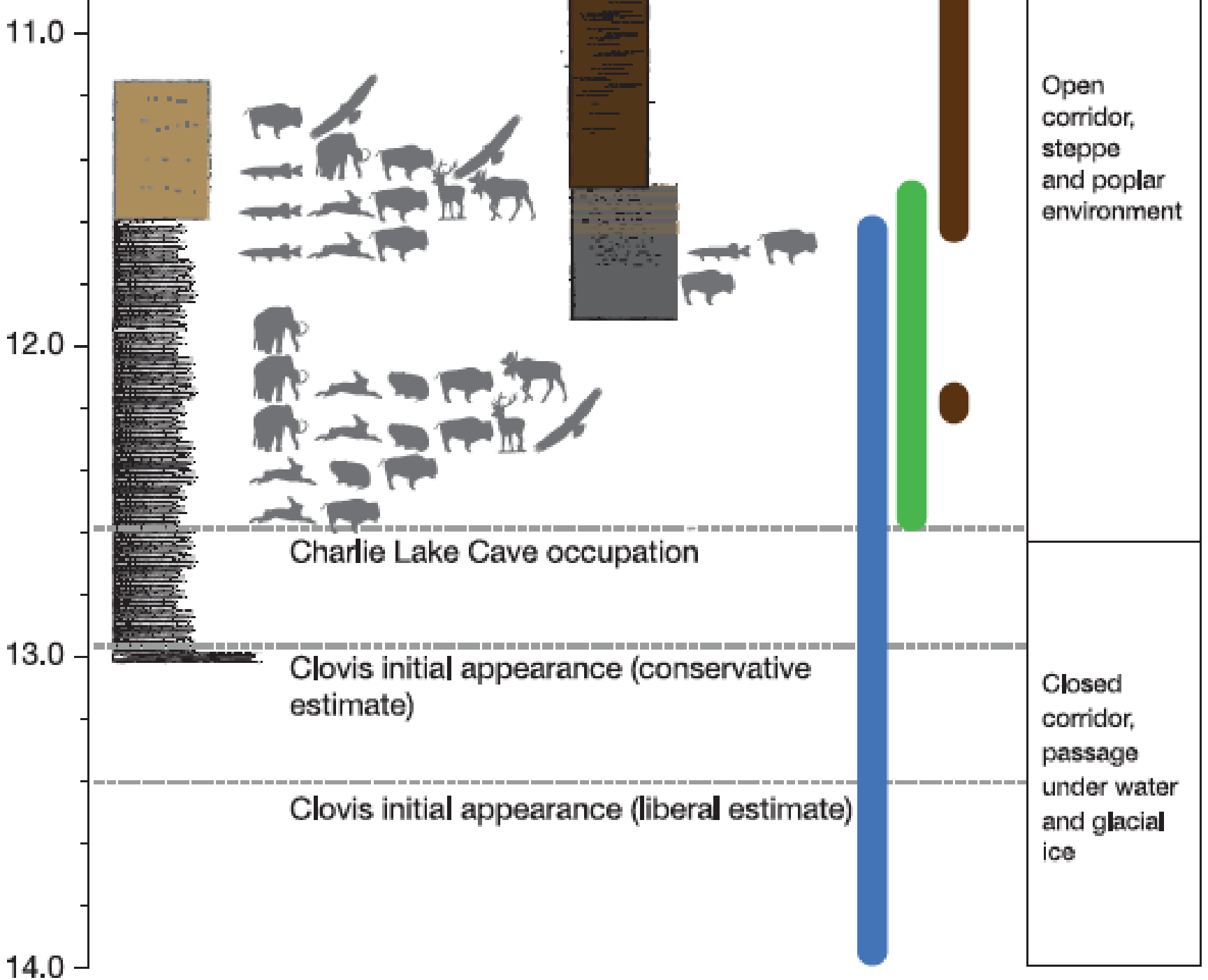


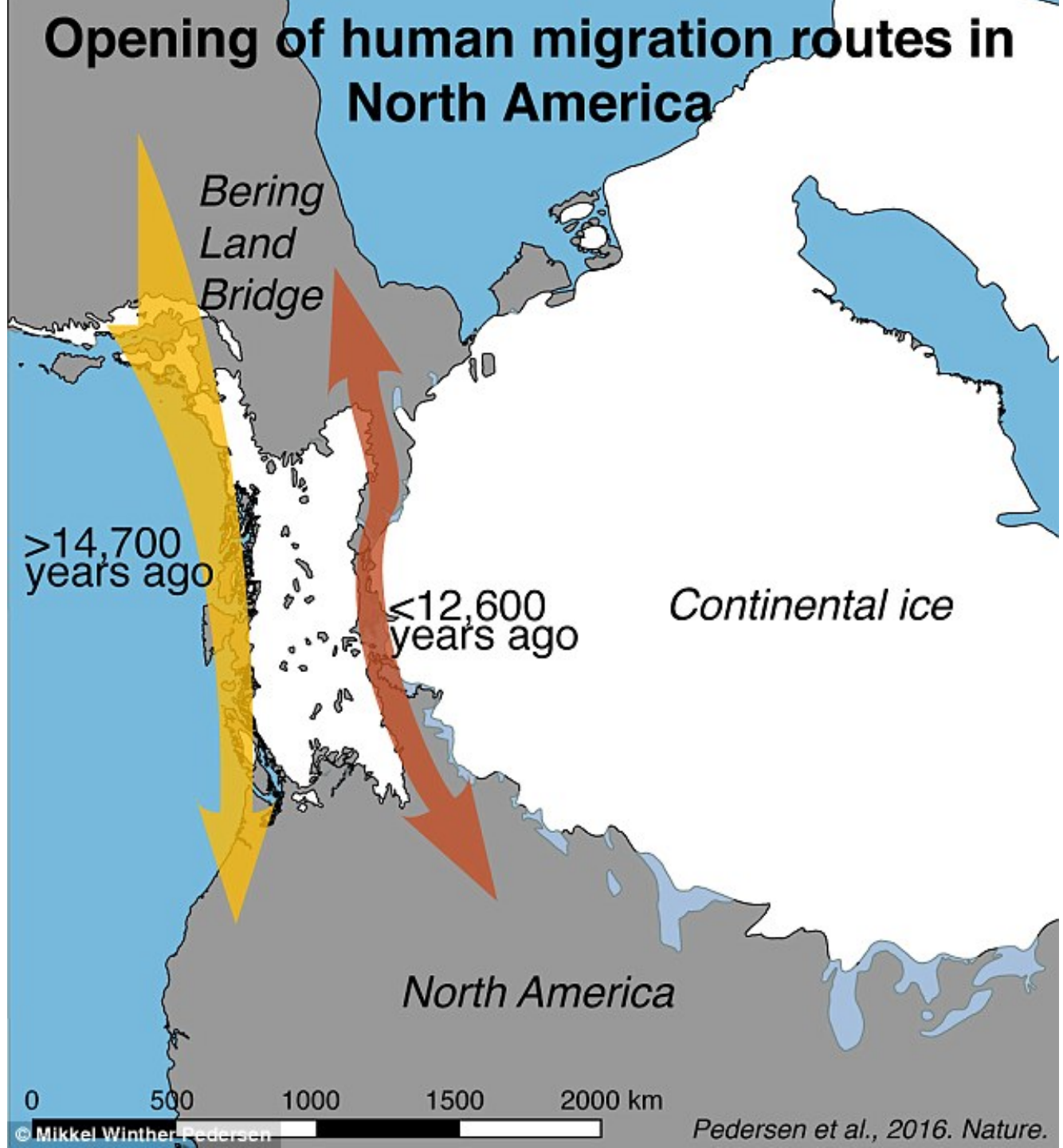
CLOVIS: 12,750-13,400 yrs ago

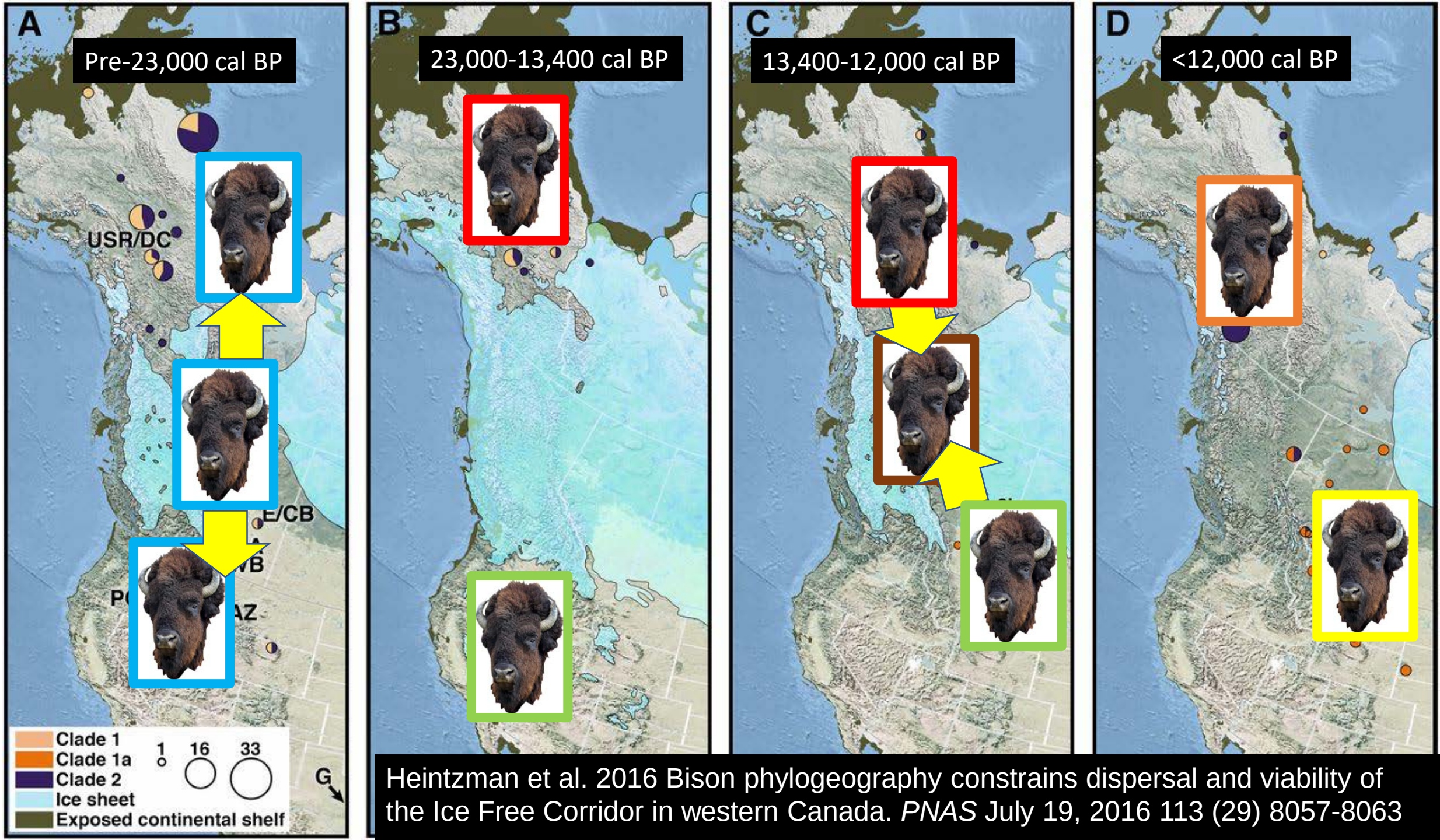

a
70° N
180°
140° W
100° W
80° W
160° E
50° N
180°
Bering
Land
Bridge
Laurentide
Ice Sheet
IFC
Cordilleran
Ice Sheet
b
160° W
140° W
120° W
b
122° W
120° W
118° W
57° N
56° N
55° N
A′
B′
B
Charlie Lake
Spring Lake
A
Grande Prairie
0
50
100
Kilometres
122° W
120° W
118° W



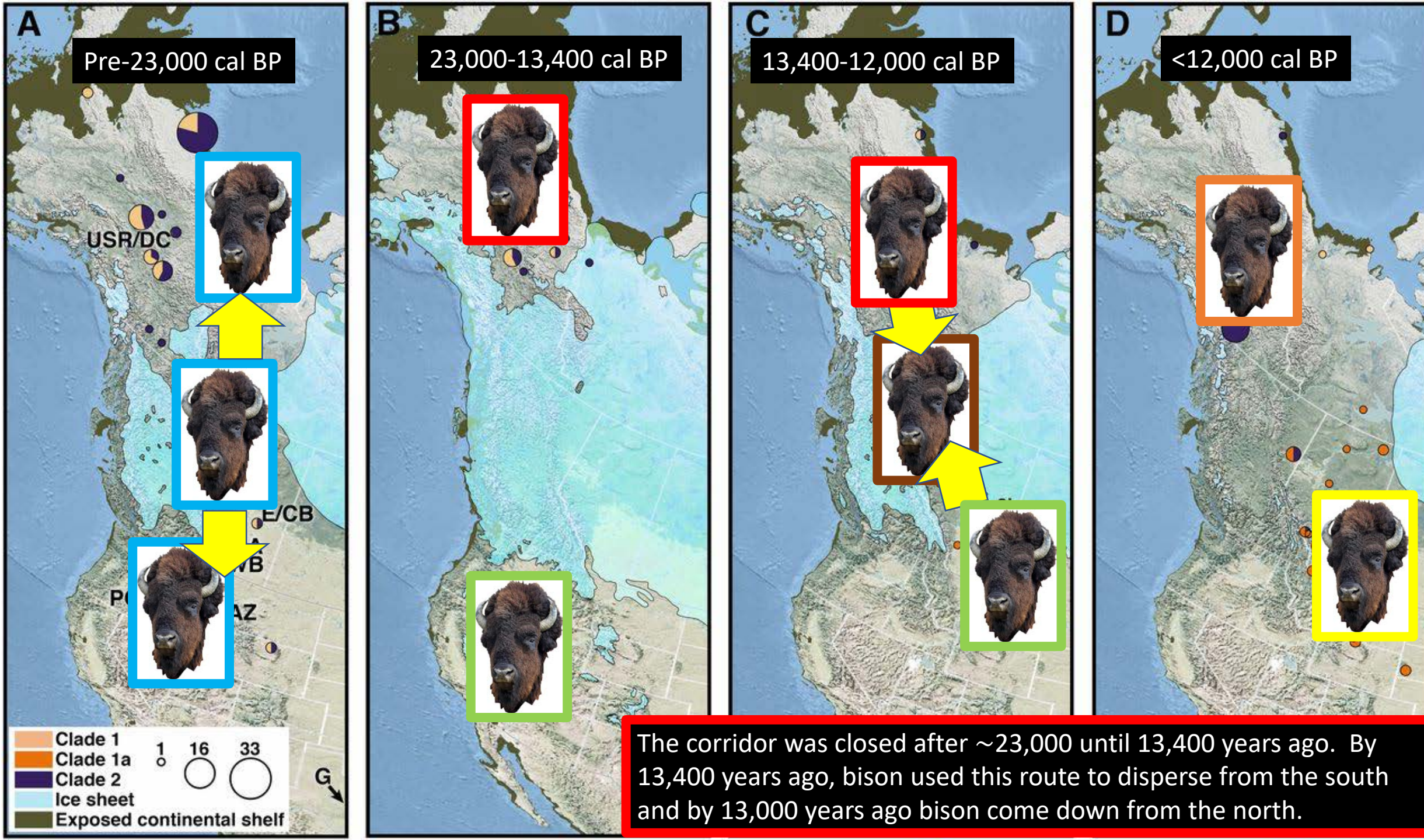
Extended Data Figure 1 | Topographic transects. The red and white lines on Fig. 1b mark topographic transects of Charlie Lake and Spring Lake in relation to the four phases of Glacial Lake Peace[13]. CIC, Cordilleran ice complex; m.a.s.l., metres above sea level.


11.0
12.0
13.0
14.0
Charlie Lake Cave occupation
Clovis initial appearance (conservative estimate)
Clovis initial appearance (liberal estimate)
Open corridor, steppe and poplar environment
Closed corridor, passage under water and glacial ice

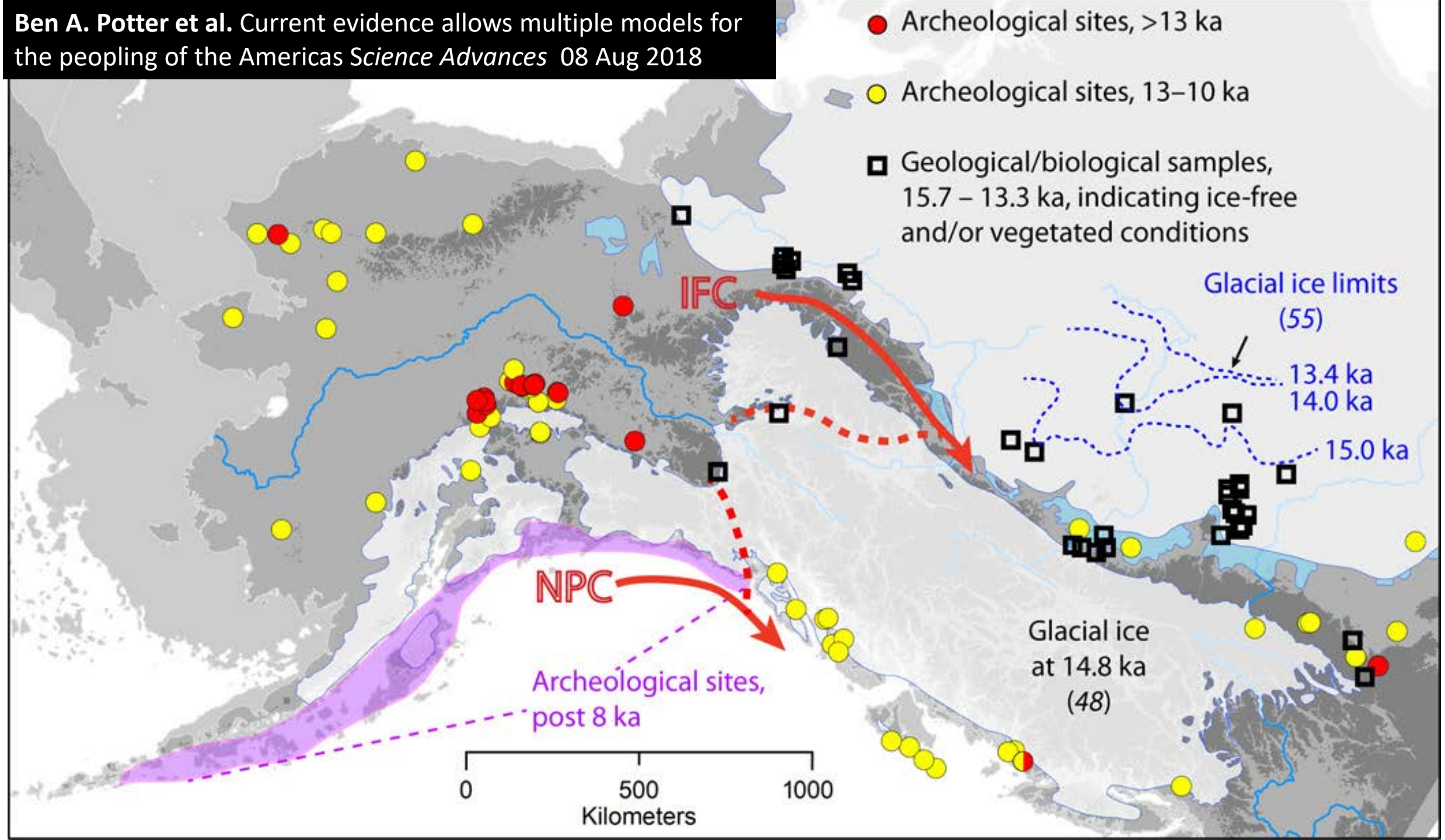

Opening of human migration routes in North America
Bering Land Bridge
>14,700 years ago
≤12,600 years ago
Continental ice
North America
0
500
1000
1500
2000 km
© Mikkel Winther-Pedersen
Pedersen et al., 2016. Nature.



Heintzman et al. 2016 Bison phylogeography constrains dispersal and viability of the Ice Free Corridor in western Canada. *PNAS* July 19, 2016 113 (29) 8057-8063


A
Pre-23,000 cal BP
USR/DC
E/CB
B
23,000-13,400 cal BP
C
13,400-12,000 cal BP
D
<12,000 cal BP
Clade 1
Clade 1a
Clade 2
Ice sheet
Exposed continental shelf
1
16
33
G
The corridor was closed after ~23,000 until 13,400 years ago. By 13,400 years ago, bison used this route to disperse from the south and by 13,000 years ago bison come down from the north.

Ben A. Potter et al. Current evidence allows multiple models for the peopling of the Americas *Science Advances* 08 Aug 2018



Clovis Paleoindian Tradition
~13,400-12,750 years ago

What if an interior corridor was open by ~14,800 years ago?

- We should find sites dating to 14,800 years ago and younger south of the continental ice sheets a nd oldest sites should be in the Interior Corridor

- If Clovis people used this earlier Interior Corridor, then we might find even earlier Clovis sites there or south of the ice

- This would keep the Clovis First model alive…

- Excavations at the Gault (and Friedkin) Site in Texas have uncovered cultural materials below a well-defined Clovis layer

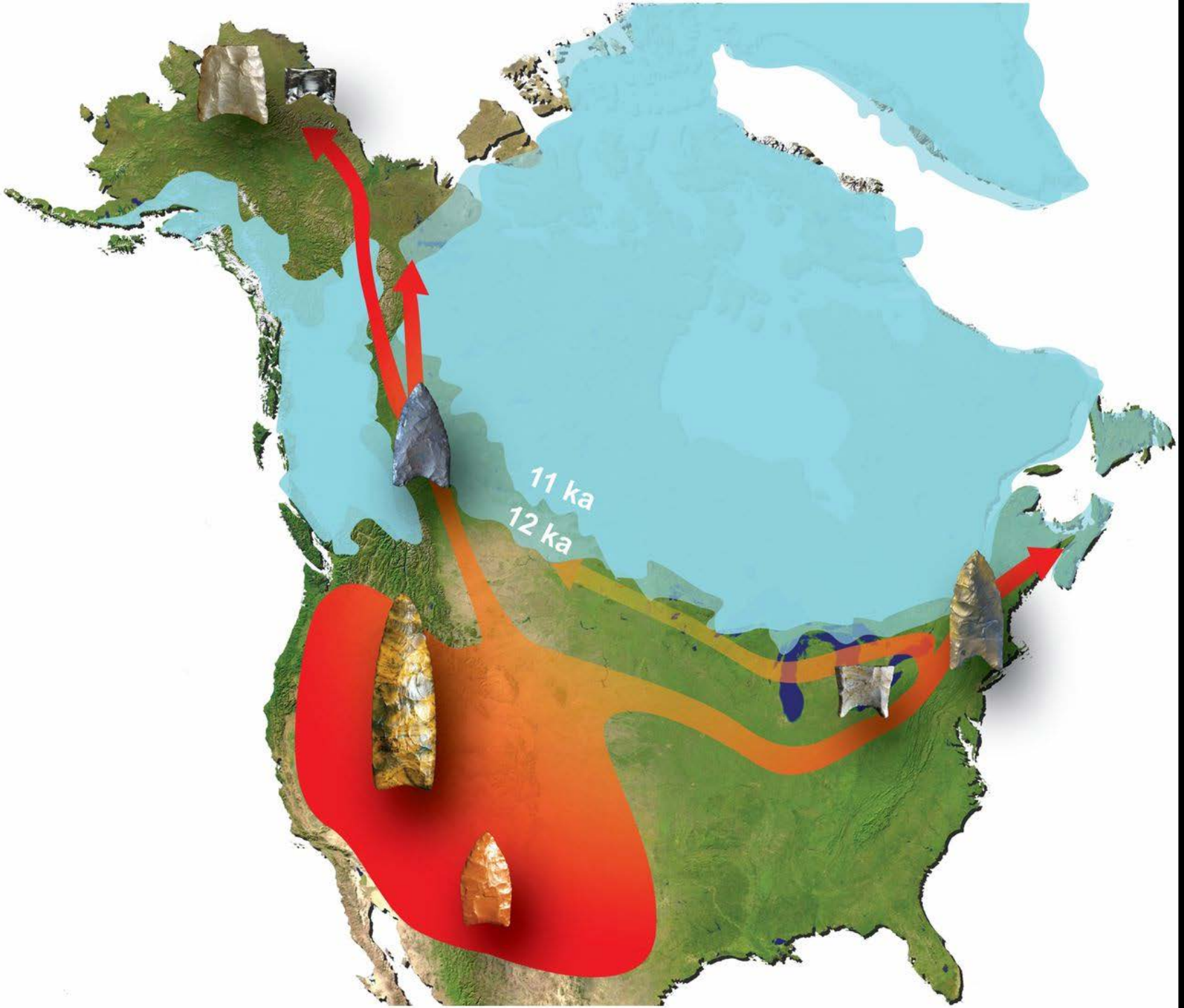
- What did these “Older Than Clovis” artifacts look like?

- Are they proto-Clovis technologies?

Gault Site, TX

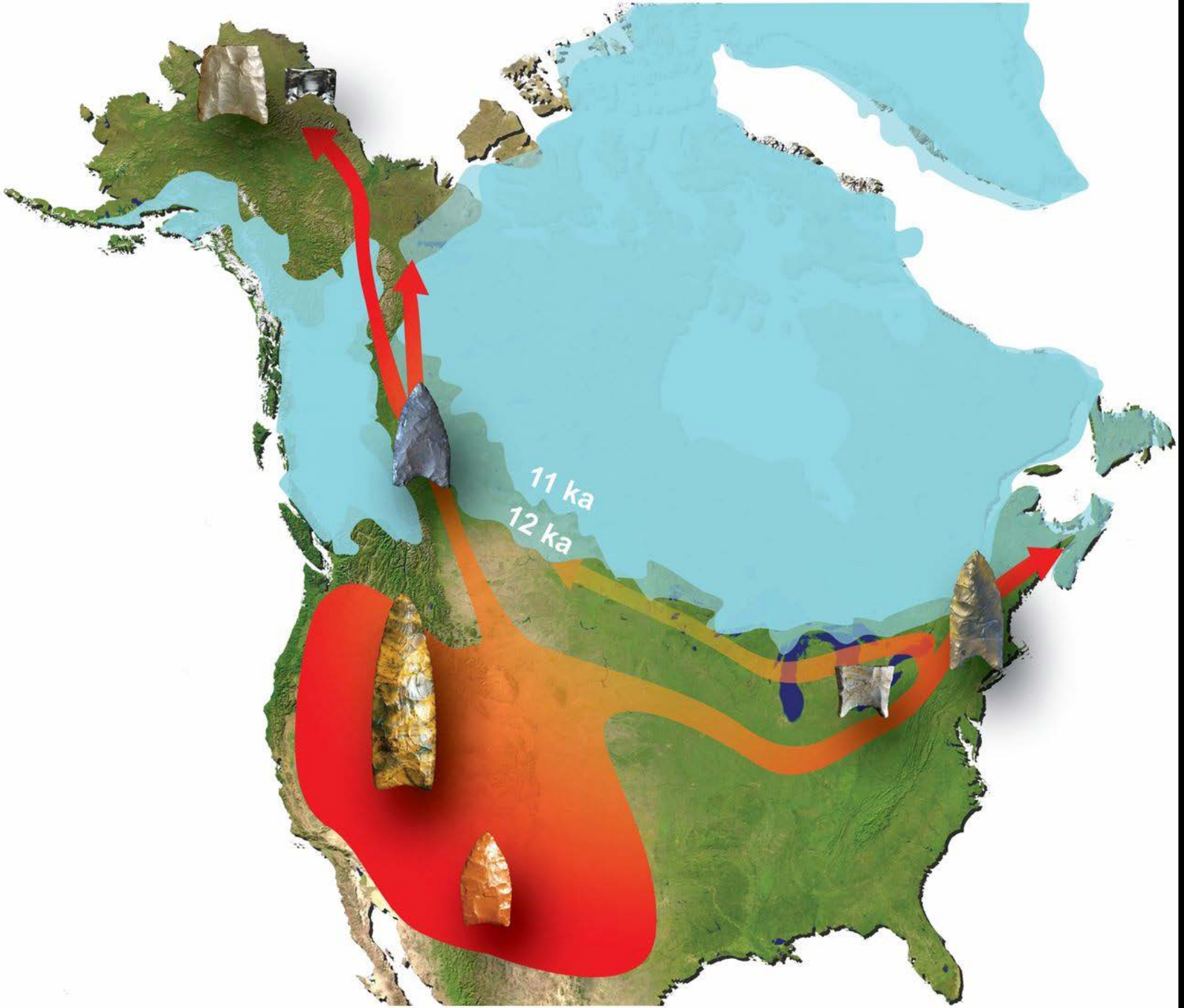
~15,000 years old

Friedkin Site, TX



Just when you thought you knew what was going on…

Clovis points date older in the south and youngest in Alaska



Just when you thought you knew what was going on…

Clovis points date older in the south and youngest in Alaska

CLOVIS IS NOT FIRST…We need another model

LOWER SALMON RIVER CANYON, IDAHO

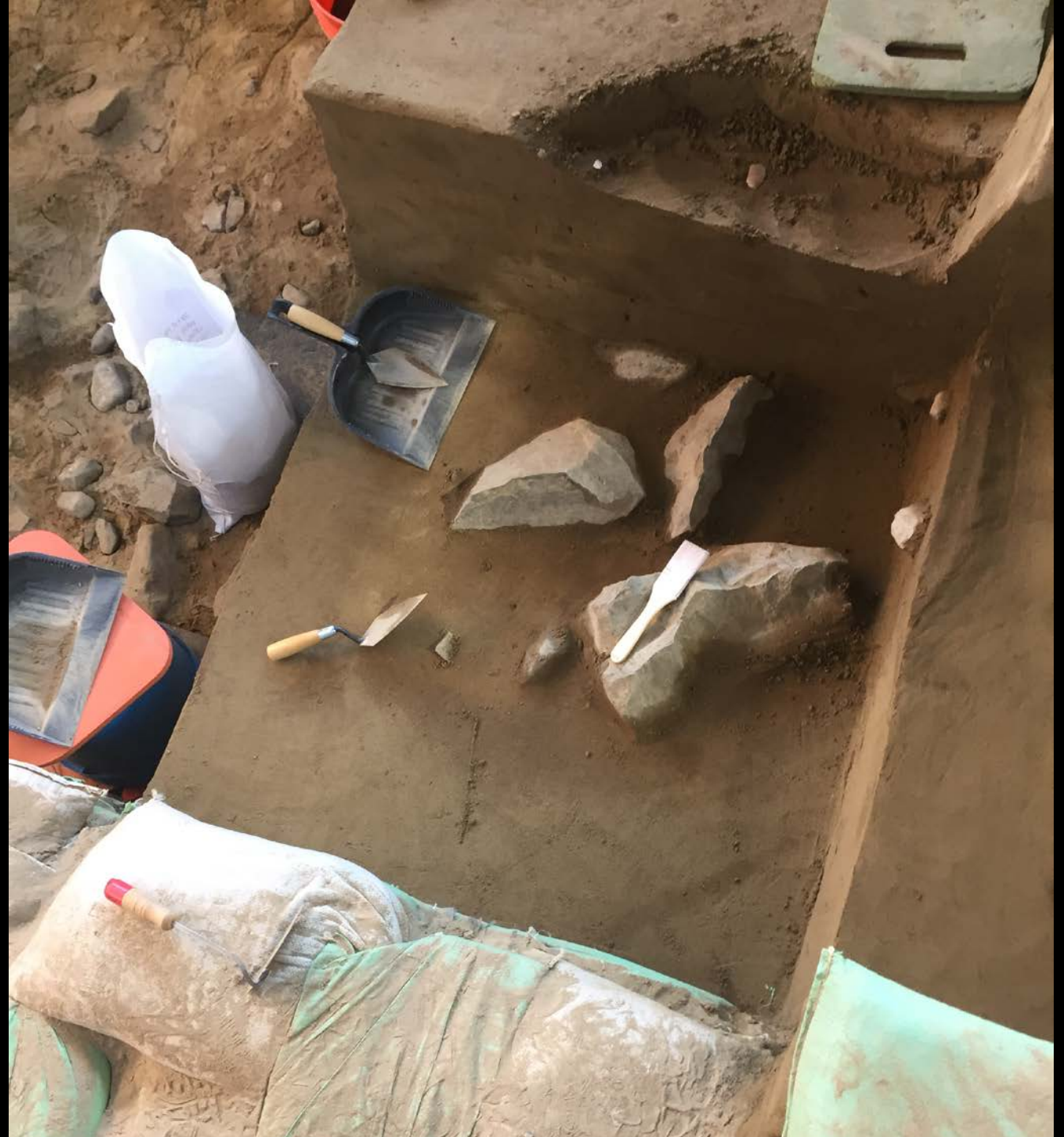

N
AREA A
6 x 12 m
2014 Expansion
AREA B
6 x 6 m
12 x 12 m

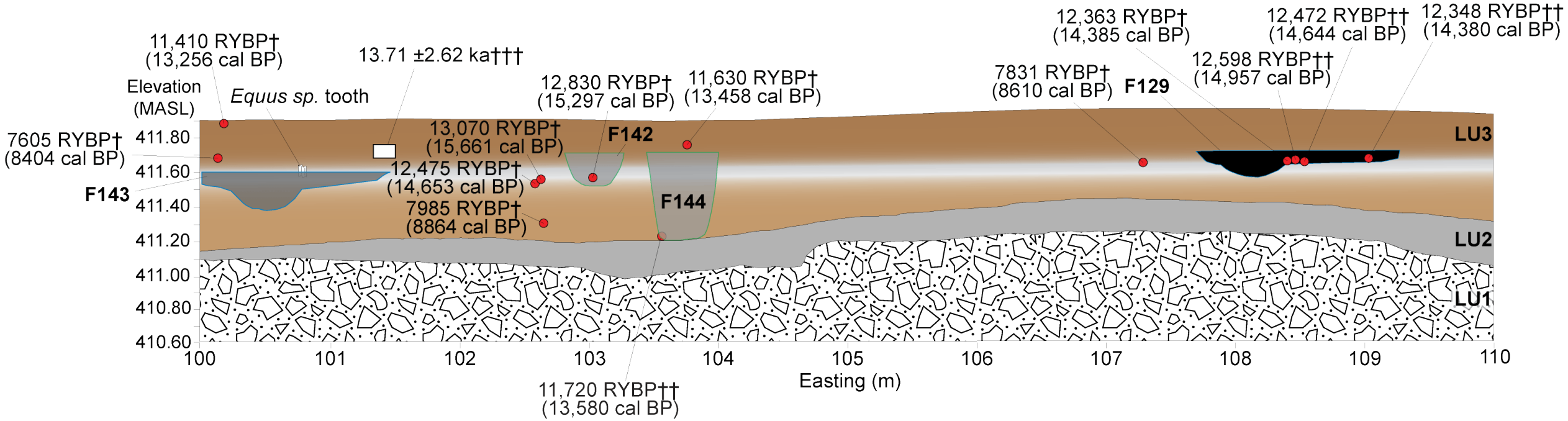

LET'S
DO
THIS.

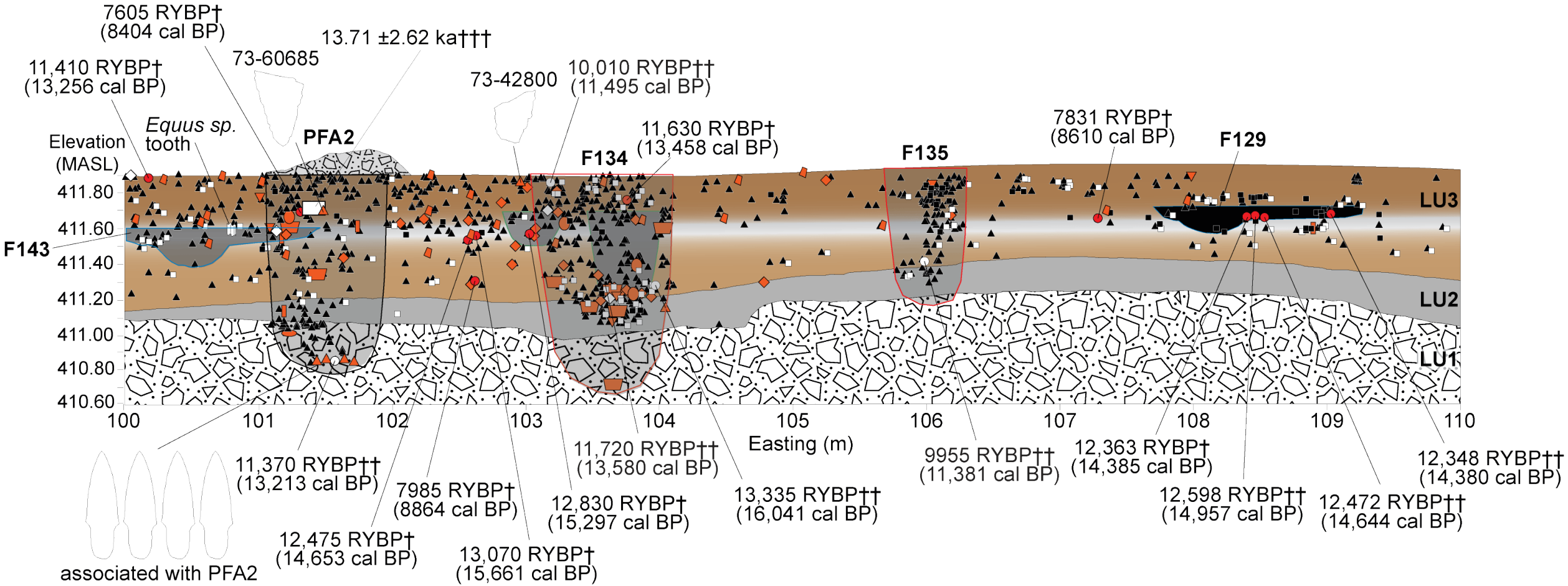

10IH73
COOPER'S FERRY
FIELD SCHOOL
05 AUGUST 2018
OREGON STATE
UNIVERSITY
Taste of
Italy

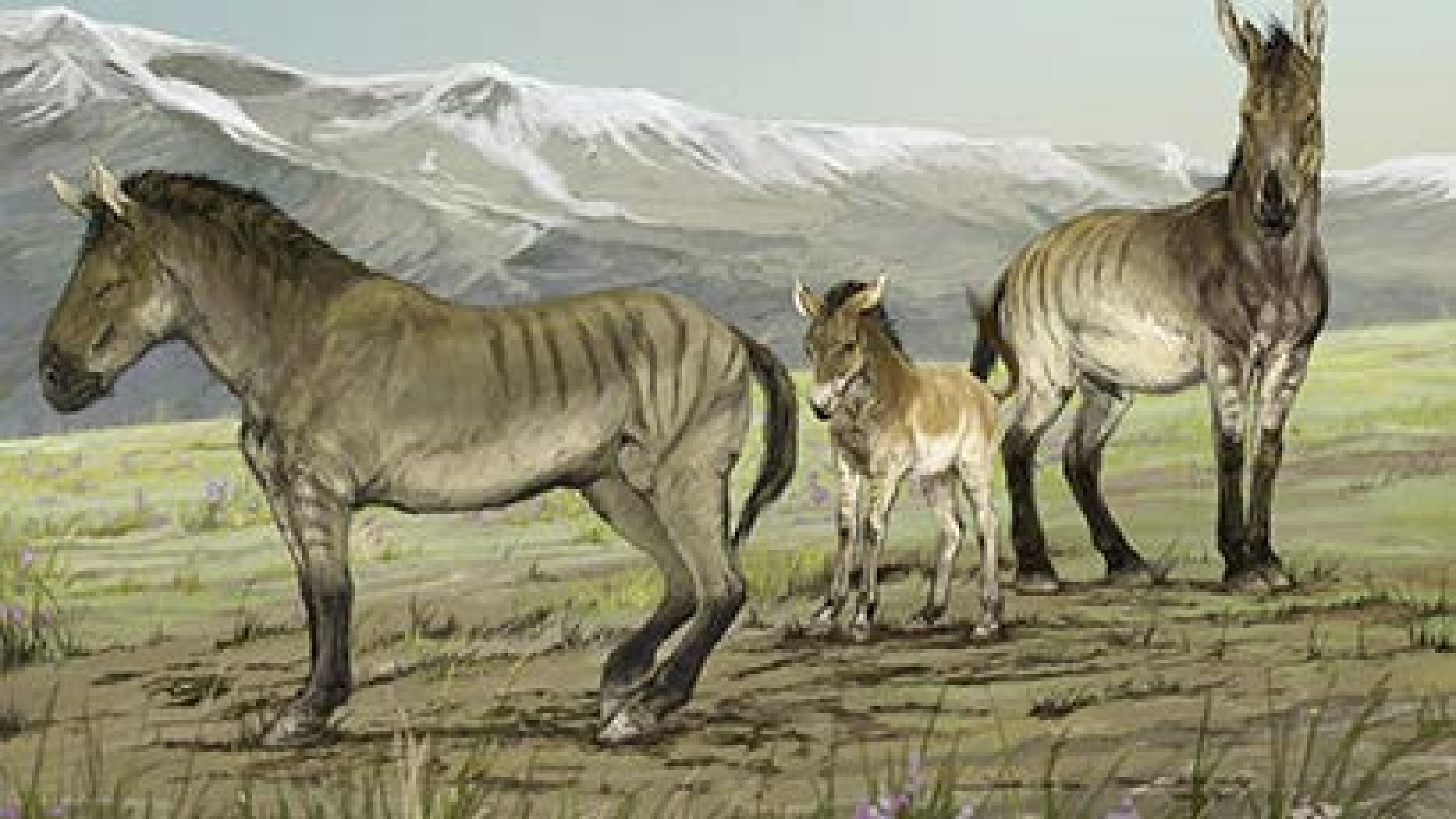

Fill
LU8
iron enriched LU6
LU6
this is dried
unaltered LU6
LU5
this is dried
LU4
rubified weak A horizon
calcic B horizon
LU3
loess parent material C horizon
Rock Cree
Paleosol
LU2
LU1

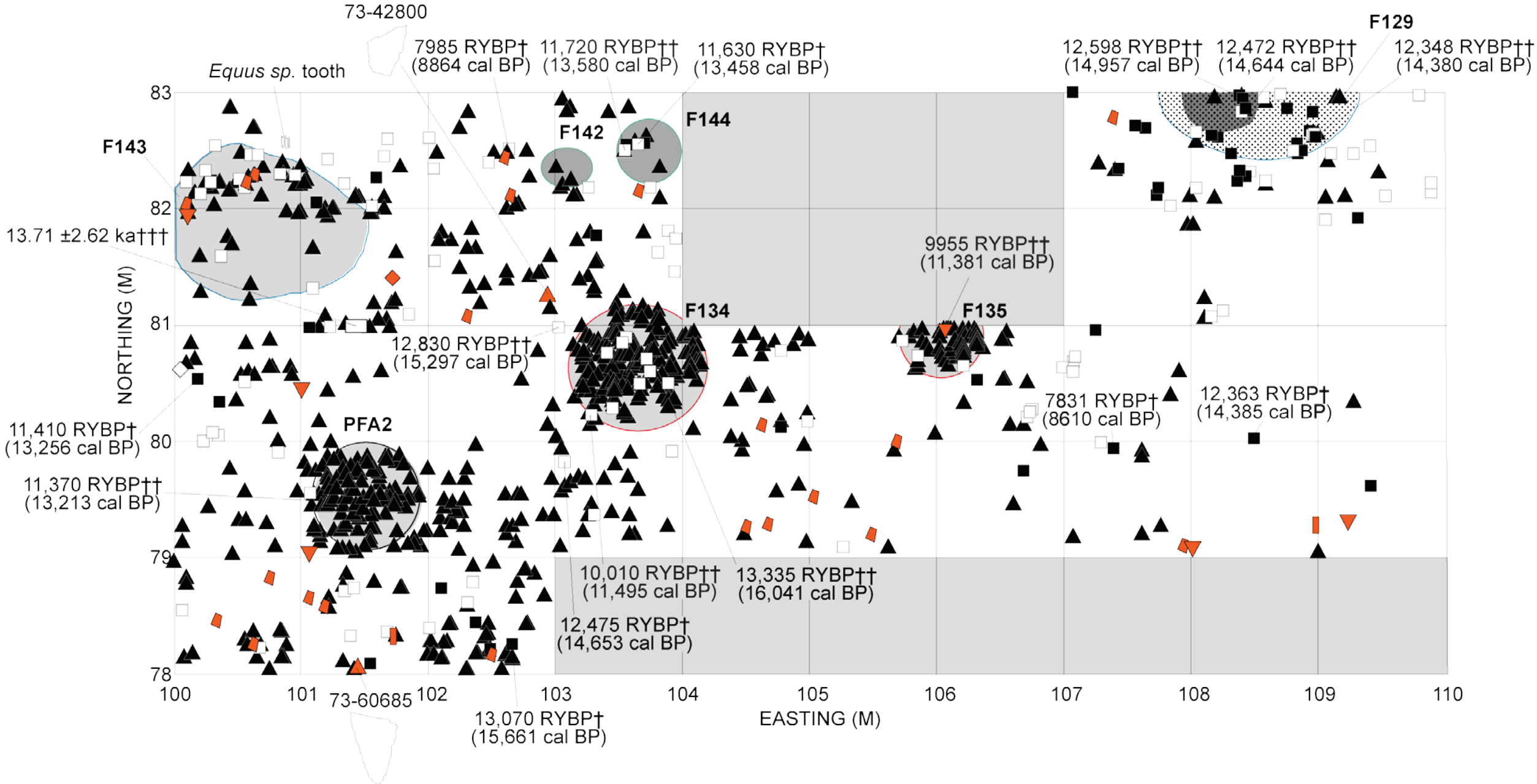

Fill
LU8
iron enriched LU6
LU6
this is dried
unaltered LU6
LU5
this is dried
LU4
rubified weak A horizon
calcic B horizon
LU3
loess parent material C horizon
Rock Cree
Paleosol
LU2
LU1

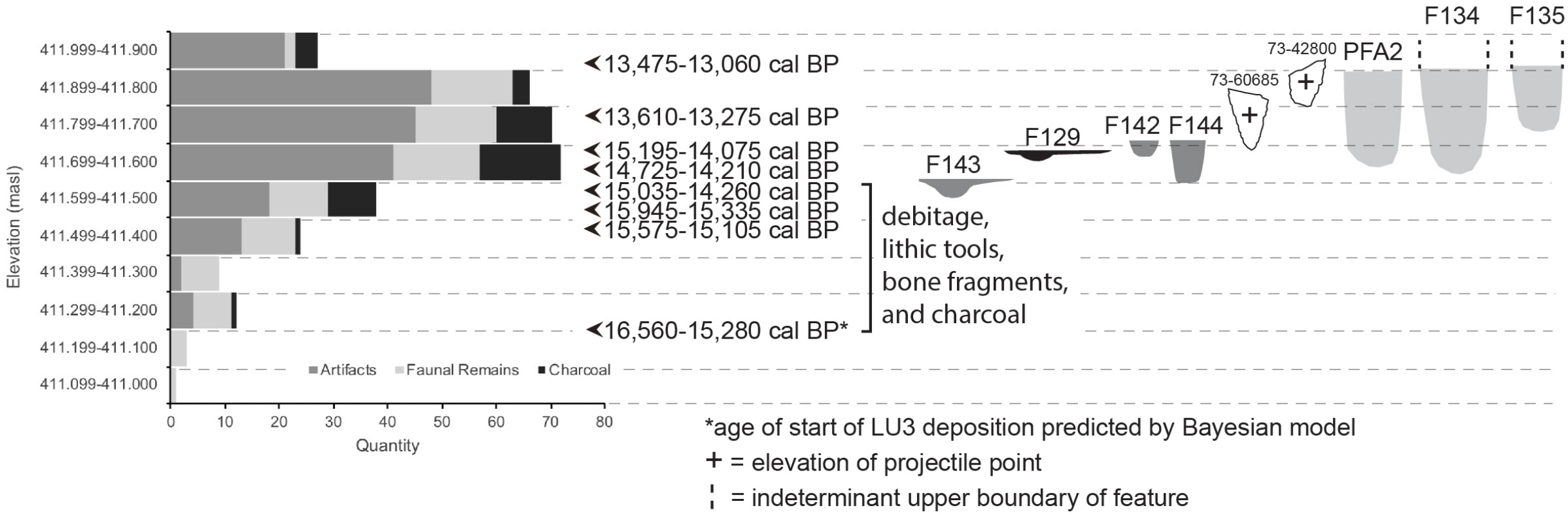



11,410 RYBP†
(13,256 cal BP)
13.71 ±2.62 ka†††
12,830 RYBP†
(15,297 cal BP)
11,630 RYBP†
(13,458 cal BP)
12,363 RYBP†
(14,385 cal BP)
12,472 RYBP††
(14,644 cal BP)
12,348 RYBP††
(14,380 cal BP)
12,598 RYBP††
(14,957 cal BP)
7831 RYBP†
(8610 cal BP)
F129
Elevation
(MASL)
Equus sp. tooth
7605 RYBP†
(8404 cal BP)
13,070 RYBP†
(15,661 cal BP)
F142
12,475 RYBP†
(14,653 cal BP)
F143
7985 RYBP†
(8864 cal BP)
F144
LU3
LU2
LU1
411.80
411.60
411.40
411.20
411.00
410.80
410.60
100
101
102
103
104
105
106
107
108
109
110
Easting (m)
11,720 RYBP††
(13,580 cal BP)


7605 RYBP†
(8404 cal BP)
13.71 ±2.62 ka†††
73-60685
73-42800
10,010 RYBP††
(11,495 cal BP)
11,410 RYBP†
(13,256 cal BP)
Equus sp.
tooth
PFA2
F134
11,630 RYBP†
(13,458 cal BP)
F135
7831 RYBP†
(8610 cal BP)
F129
Elevation
(MASL)
411.80
411.60
411.40
411.20
411.00
410.80
410.60
F143
LU3
LU2
LU1
100
101
102
103
104
105
106
107
108
109
110
Easting (m)
11,370 RYBP††
(13,213 cal BP)
7985 RYBP†
(8864 cal BP)
12,830 RYBP†
(15,297 cal BP)
11,720 RYBP††
(13,580 cal BP)
13,335 RYBP††
(16,041 cal BP)
9955 RYBP††
(11,381 cal BP)
12,363 RYBP†
(14,385 cal BP)
12,598 RYBP††
(14,957 cal BP)
12,472 RYBP††
(14,644 cal BP)
12,348 RYBP††
(14,380 cal BP)
12,475 RYBP†
(14,653 cal BP)
13,070 RYBP†
(15,661 cal BP)
associated with PFA2




73-42800
7985 RYBP† (8864 cal BP)
11,720 RYBP†† (13,580 cal BP)
11,630 RYBP† (13,458 cal BP)
12,598 RYBP†† (14,957 cal BP)
12,472 RYBP†† (14,644 cal BP)
F129
12,348 RYBP†† (14,380 cal BP)
Equus sp. tooth
F143
F142
F144
13.71 ±2.62 ka†††
9955 RYBP†† (11,381 cal BP)
F134
F135
12,830 RYBP†† (15,297 cal BP)
7831 RYBP† (8610 cal BP)
12,363 RYBP† (14,385 cal BP)
11,410 RYBP† (13,256 cal BP)
PFA2
11,370 RYBP†† (13,213 cal BP)
10,010 RYBP†† (11,495 cal BP)
13,335 RYBP†† (16,041 cal BP)
12,475 RYBP† (14,653 cal BP)
73-60685
13,070 RYBP† (15,661 cal BP)
NORTHING (M)
EASTING (M)
83
82
81
80
79
78
100
101
102
103
104
105
106
107
108
109
110



*age of start of LU3 deposition predicted by Bayesian model

+ = elevation of projectile point

┆ = indeterminant upper boundary of feature

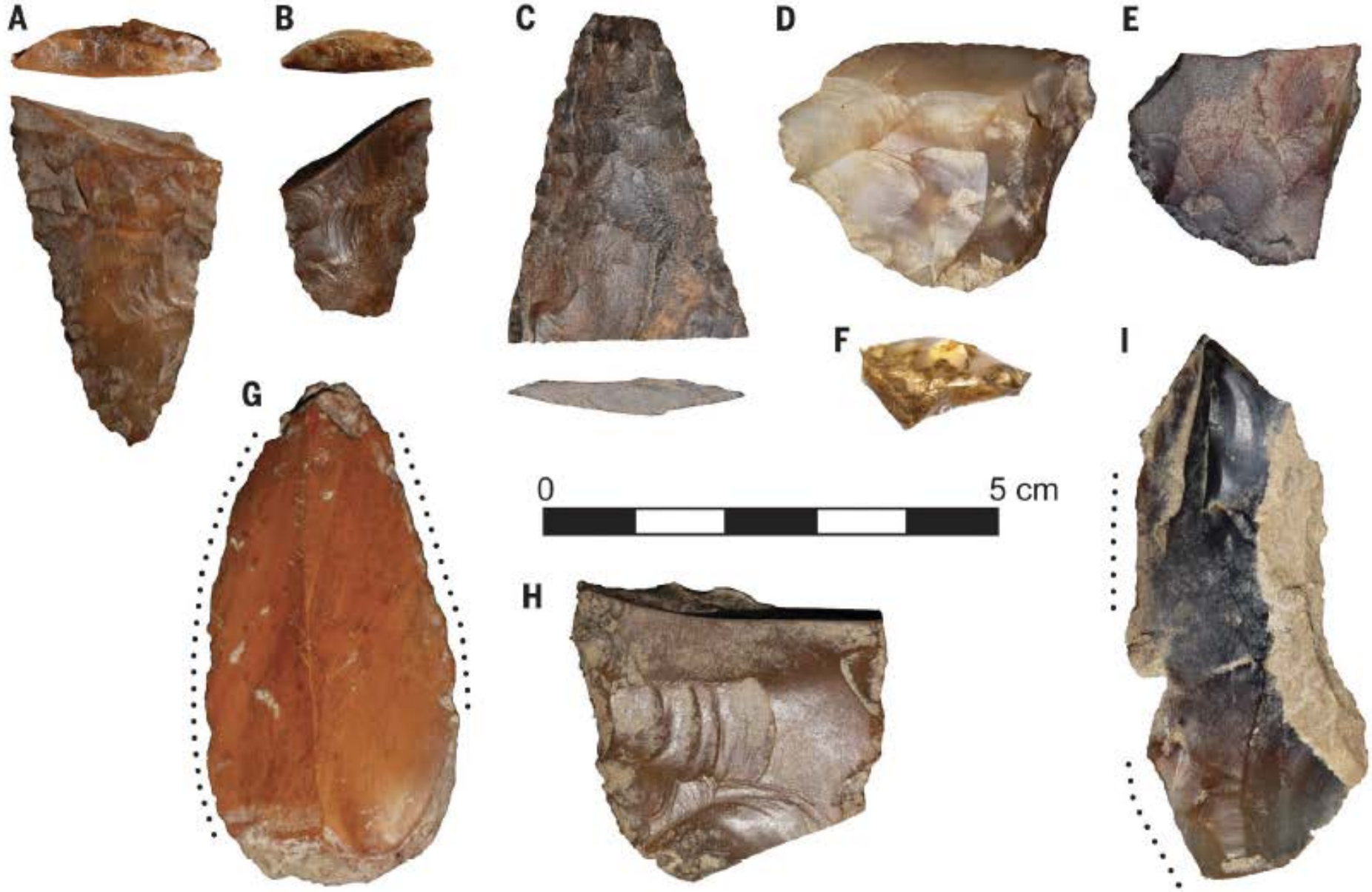
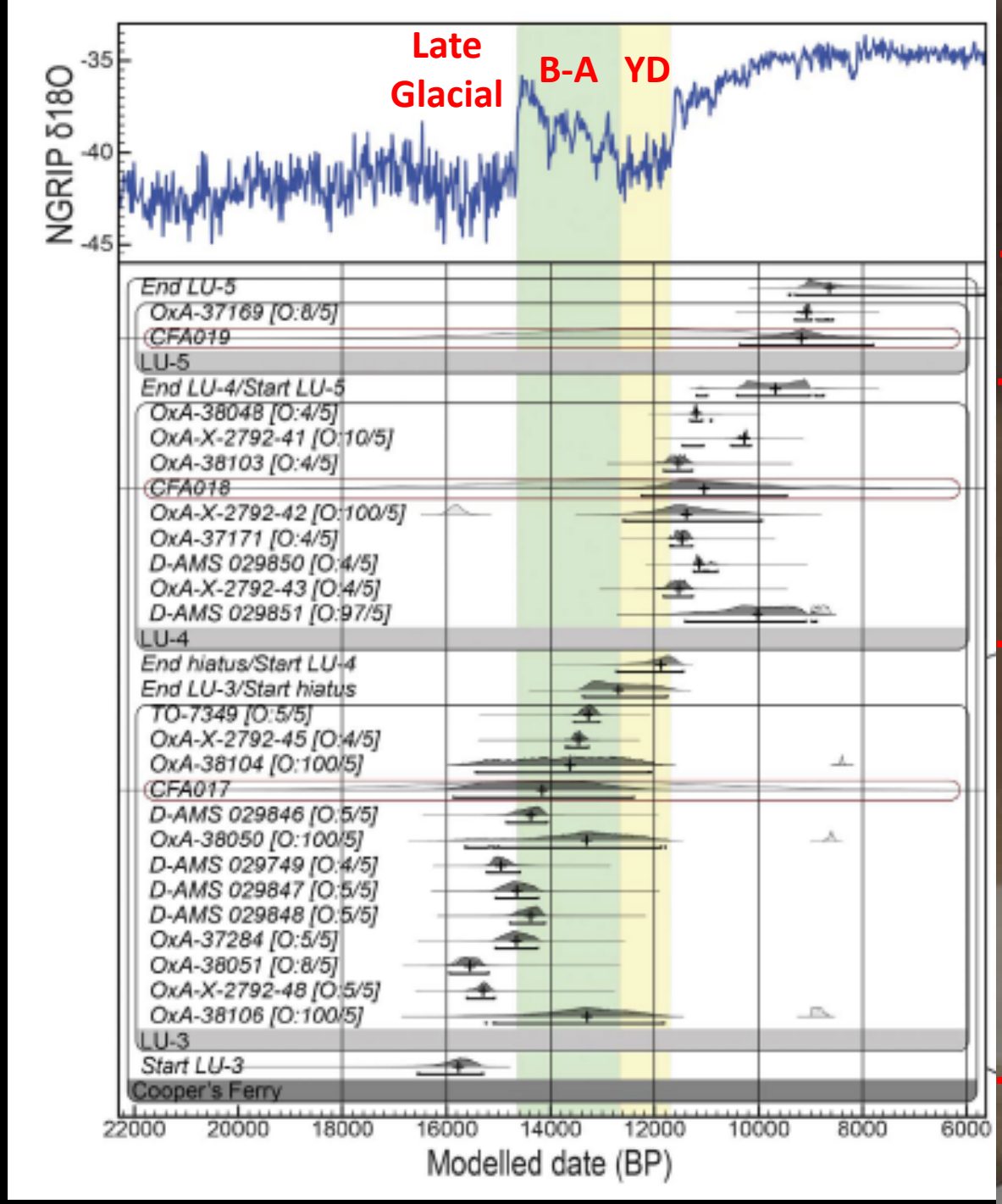


Fig. 4. Lithic tools excavated in situ from LU3. (**A**) Stemmed projectile point haft fragment from LU3 (73-60685; RN 56938). (**B**) Stemmed projectile point haft fragment from LU3 (73-42800; RN 50948). (**C**) Blade fragment of projectile point from LU3 (73-62464; RN 59067). (**D**) Biface preform fragment (73-61085; RN 57401). (**E**) Biface preform fragment (73-63034; RN 59076). (**F**) Biface preform fragment (73-61870; RN 58316). (**G**) Macroblade (73-62953; RN 59385). (**H**) Biface preform fragment (73-62887; RN 59367). (**I**) Macroblade (73-60855; RN 57072). Dots show areas with use wear.



LU6

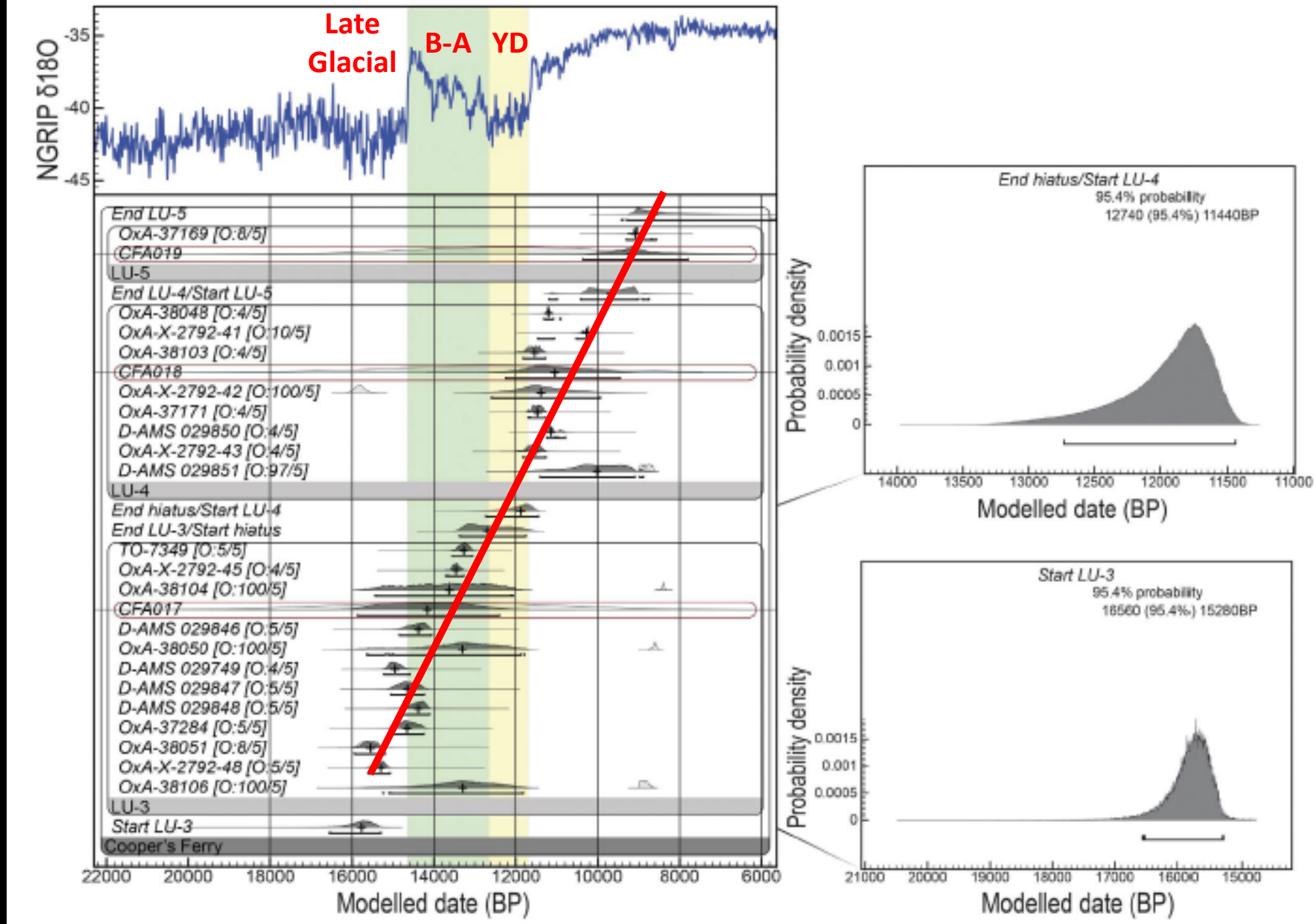
LU5

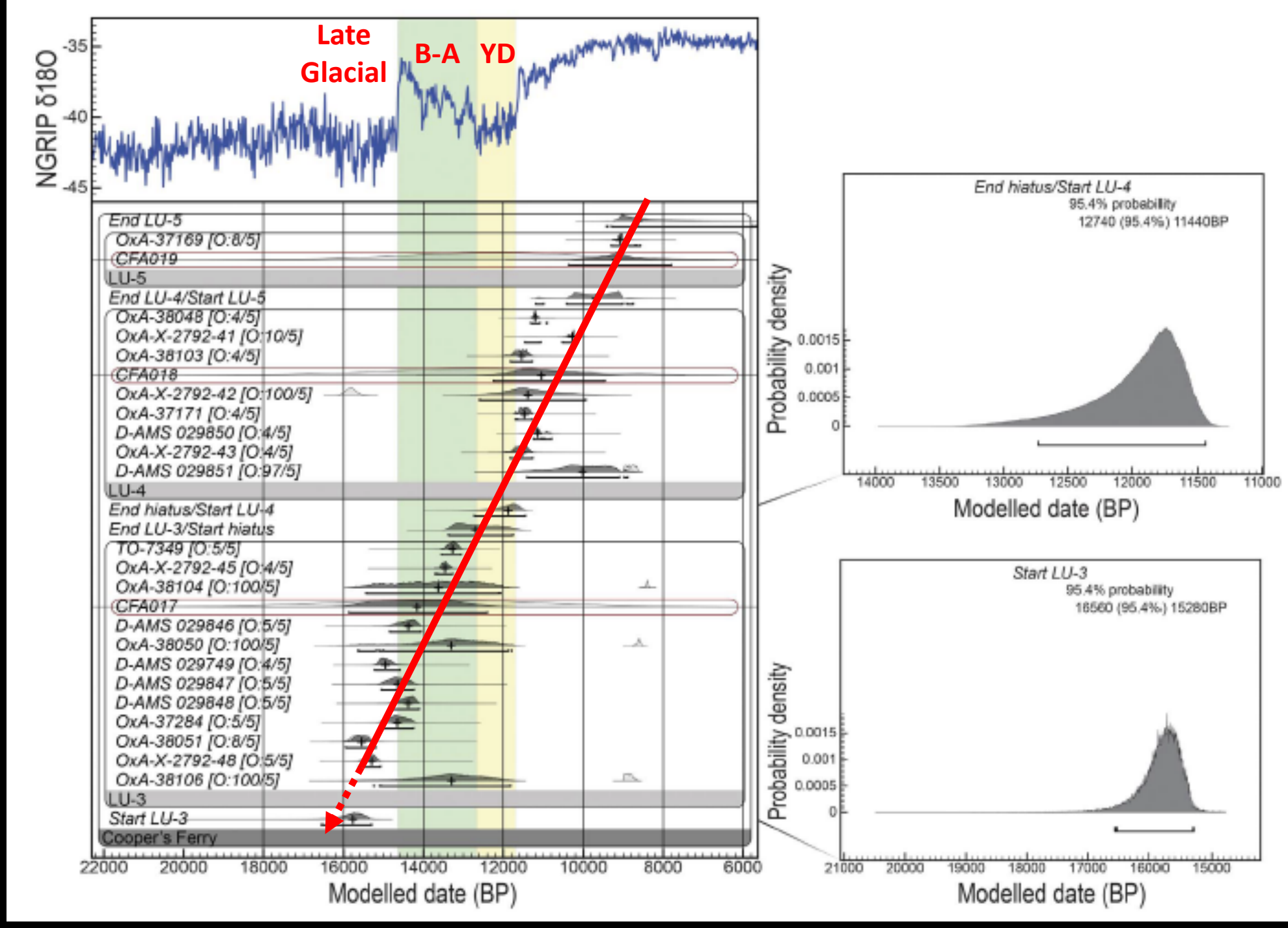
LU4

LU3

LU2

LU1


Late Glacial
B-A
YD
NGRIP δ18O
-35
-40
-45
End LU-5
OxA-37169 [O:8/5]
CFA019
LU-5
End LU-4/Start LU-5
OxA-38048 [O:4/5]
OxA-X-2792-41 [O:10/5]
OxA-38103 [O:4/5]
CFA018
OxA-X-2792-42 [O:100/5]
OxA-37171 [O:4/5]
D-AMS 029850 [O:4/5]
OxA-X-2792-43 [O:4/5]
D-AMS 029851 [O:97/5]
LU-4
End hiatus/Start LU-4
End LU-3/Start hiatus
TO-7349 [O:5/5]
OxA-X-2792-45 [O:4/5]
OxA-38104 [O:100/5]
CFA017
D-AMS 029846 [O:5/5]
OxA-38050 [O:100/5]
D-AMS 029749 [O:4/5]
D-AMS 029847 [O:5/5]
D-AMS 029848 [O:5/5]
OxA-37284 [O:5/5]
OxA-38051 [O:8/5]
OxA-X-2792-48 [O:5/5]
OxA-38106 [O:100/5]
LU-3
Start LU-3
Cooper's Ferry
22000 20000 18000 16000 14000 12000 10000 8000 6000
Modelled date (BP)
End hiatus/Start LU-4
95.4% probability
12740 (95.4%) 11440BP
Probability density
0.0015
0.001
0.0005
0
14000 13500 13000 12500 12000 11500 11000
Modelled date (BP)
Start LU-3
95.4% probability
16560 (95.4%) 15280BP
Probability density
0.0015
0.001
0.0005
0
21000 20000 19000 18000 17000 16000 15000
Modelled date (BP)


Late Glacial
B-A
YD
NGRIP δ18O
-35
-40
-45
End LU-5
OxA-37169 [O:8/5]
CFA019
LU-5
End LU-4/Start LU-5
OxA-38048 [O:4/5]
OxA-X-2792-41 [O:10/5]
OxA-38103 [O:4/5]
CFA018
OxA-X-2792-42 [O:100/5]
OxA-37171 [O:4/5]
D-AMS 029850 [O:4/5]
OxA-X-2792-43 [O:4/5]
D-AMS 029851 [O:97/5]
LU-4
End hiatus/Start LU-4
End LU-3/Start hiatus
TO-7349 [O:5/5]
OxA-X-2792-45 [O:4/5]
OxA-38104 [O:100/5]
CFA017
D-AMS 029846 [O:5/5]
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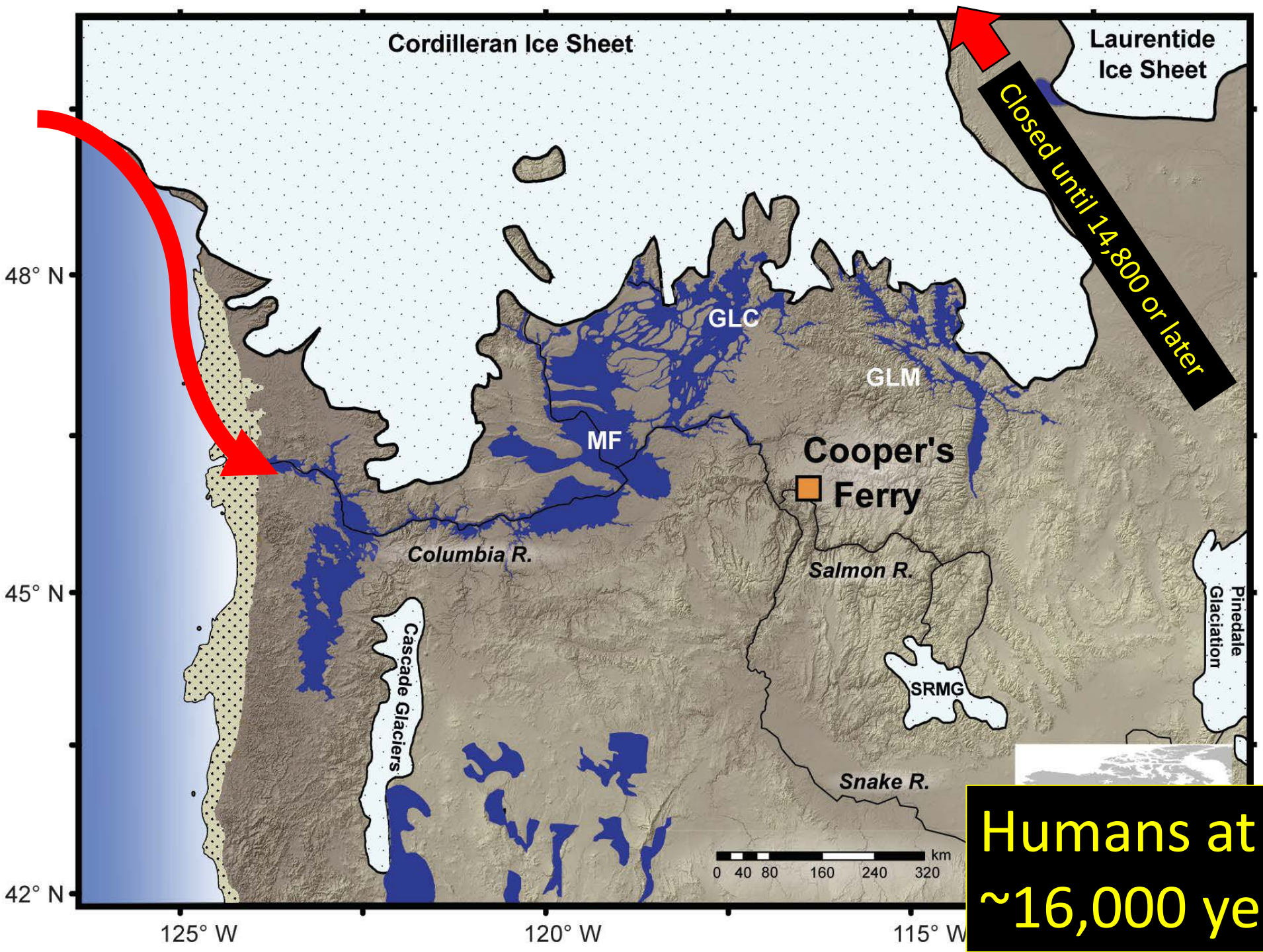
D-AMS 029749 [O:4/5]
D-AMS 029847 [O:5/5]
D-AMS 029848 [O:5/5]
OxA-37284 [O:5/5]
OxA-38051 [O:8/5]
OxA-X-2792-48 [O:5/5]
OxA-38106 [O:100/5]
LU-3
Start LU-3
Cooper's Ferry
22000 20000 18000 16000 14000 12000 10000 8000 6000
Modelled date (BP)
End hiatus/Start LU-4
95.4% probability
12740 (95.4%) 11440BP
Probability density
0.0015
0.001
0.0005
0
14000 13500 13000 12500 12000 11500 11000
Modelled date (BP)
Start LU-3
95.4% probability
16560 (95.4%) 15280BP
Probability density
0.0015
0.001
0.0005
0
21000 20000 19000 18000 17000 16000 15000
Modelled date (BP)


Fill
LU8
iron enriched LU6
LU6
this is dried
unaltered LU6
LU5
this is dried
LU4
rubified weak A horizon
calcic B horizon
LU3
loess parent material C horizon
Rock Cree
Paleosol
LU2
LU1


Cordilleran Ice Sheet
Laurentide Ice Sheet
Closed until 14,800 or later
GLC
GLM
MF
Cooper's Ferry
Columbia R.
Salmon R.
Cascade Glaciers
Pinedale Glaciation
SRMG
Snake R.
48° N
45° N
42° N
125° W
120° W
115° W
0 40 80 160 240 320 km
Humans at CF ~16,000 years

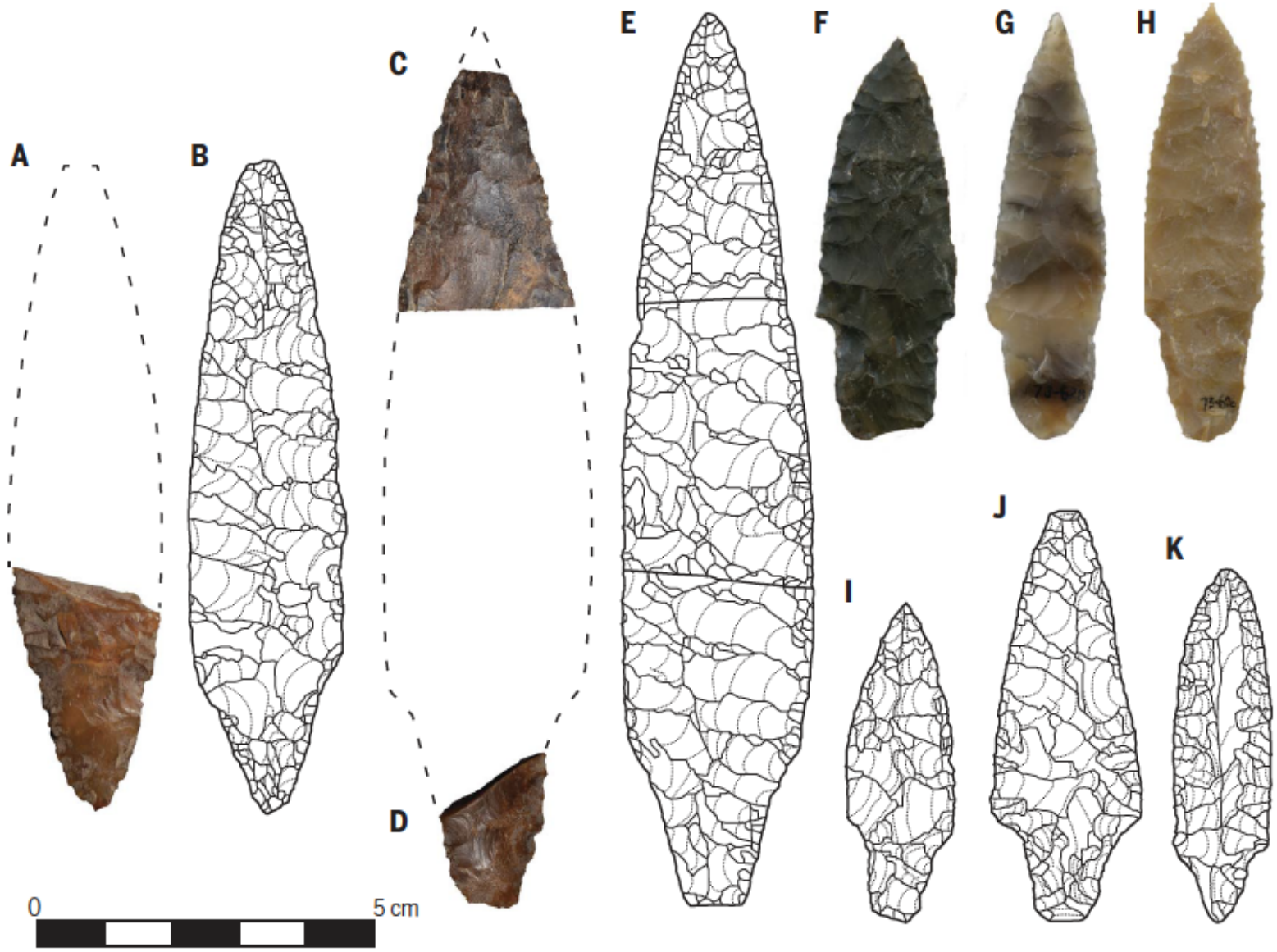
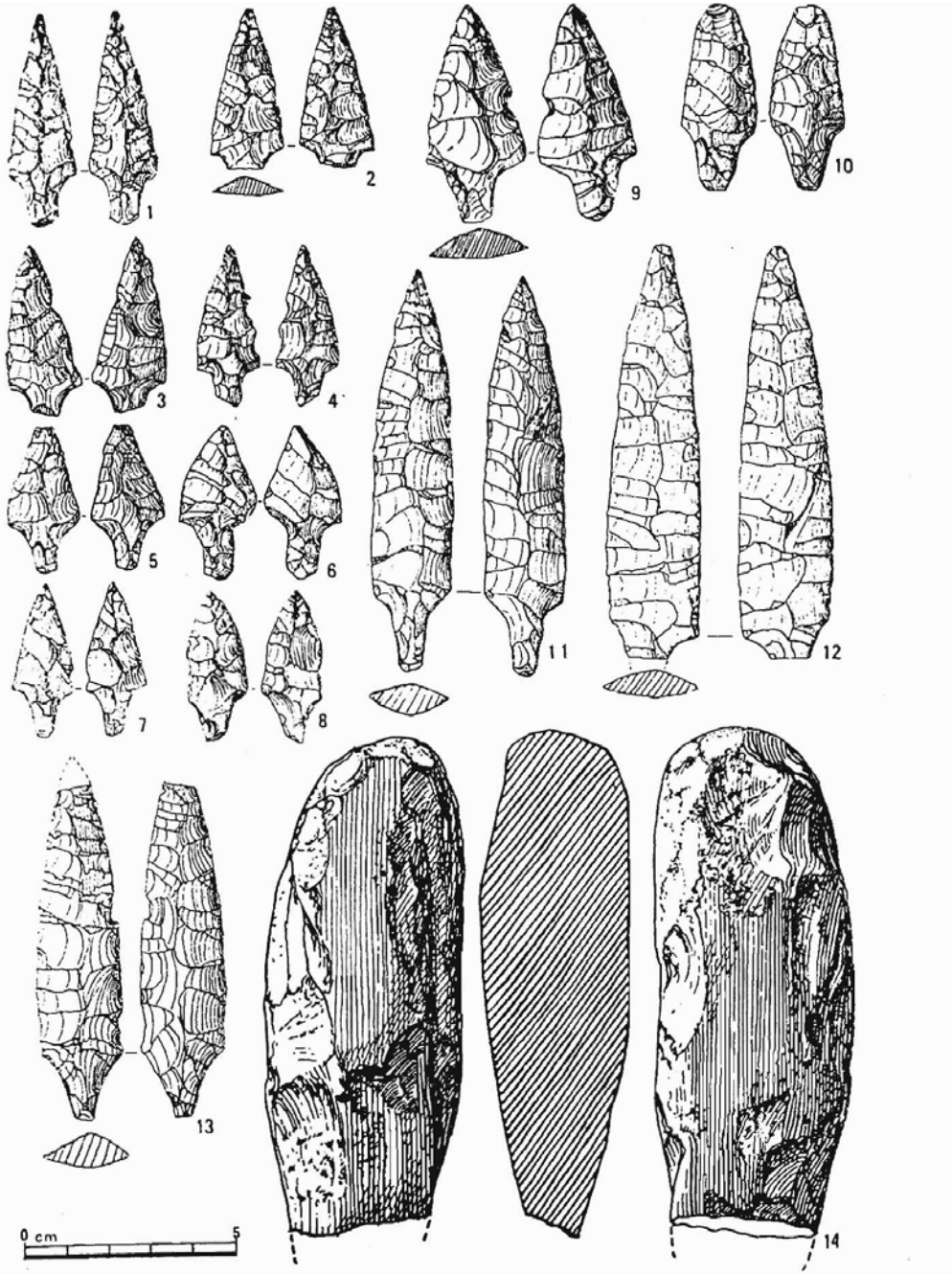


Fig. 5. Comparison of Cooper's Ferry projectile points with late Pleistocene age Tachikawa-type stemmed points from the Kamishirataki 2 site on Hokkaido, Japan. (**A**) Stemmed projectile point haft fragment from LU3 (73-60685; RN 56938). (**B**) Illustration of Japanese Upper Paleolithic stemmed projectile point from the Kamishiritaki 2 site [redrawn from (*45*)]. (**C**) Blade fragment of projectile point from LU3 (73-62464; RN 59067). (**D**) Stemmed projectile point haft fragment from LU3 (73-42800; RN 50948). (**E**) Illustration of Japanese Upper Paleolithic stemmed projectile point from the Kamishiritaki 2 site [redrawn from (*45*)] as one possible comparison for the reconstructed stemmed projectile point shown in (C) and (D). (**F**) Stemmed projectile point from PFA2 (73-627). (**G**) Stemmed projectile point from PFA2 (73-628). (**H**) Stemmed projectile point from PFA2 (73-626). (**I** to **K**) Illustrations of Japanese Upper Paleolithic stemmed projectile points from the Kamishiritaki 2 site [redrawn from (*45*)].



Tanged points and other artifacts excavated from the Tachikaru-shinai site, locality A, Hokkaido (after Yoshizaki).

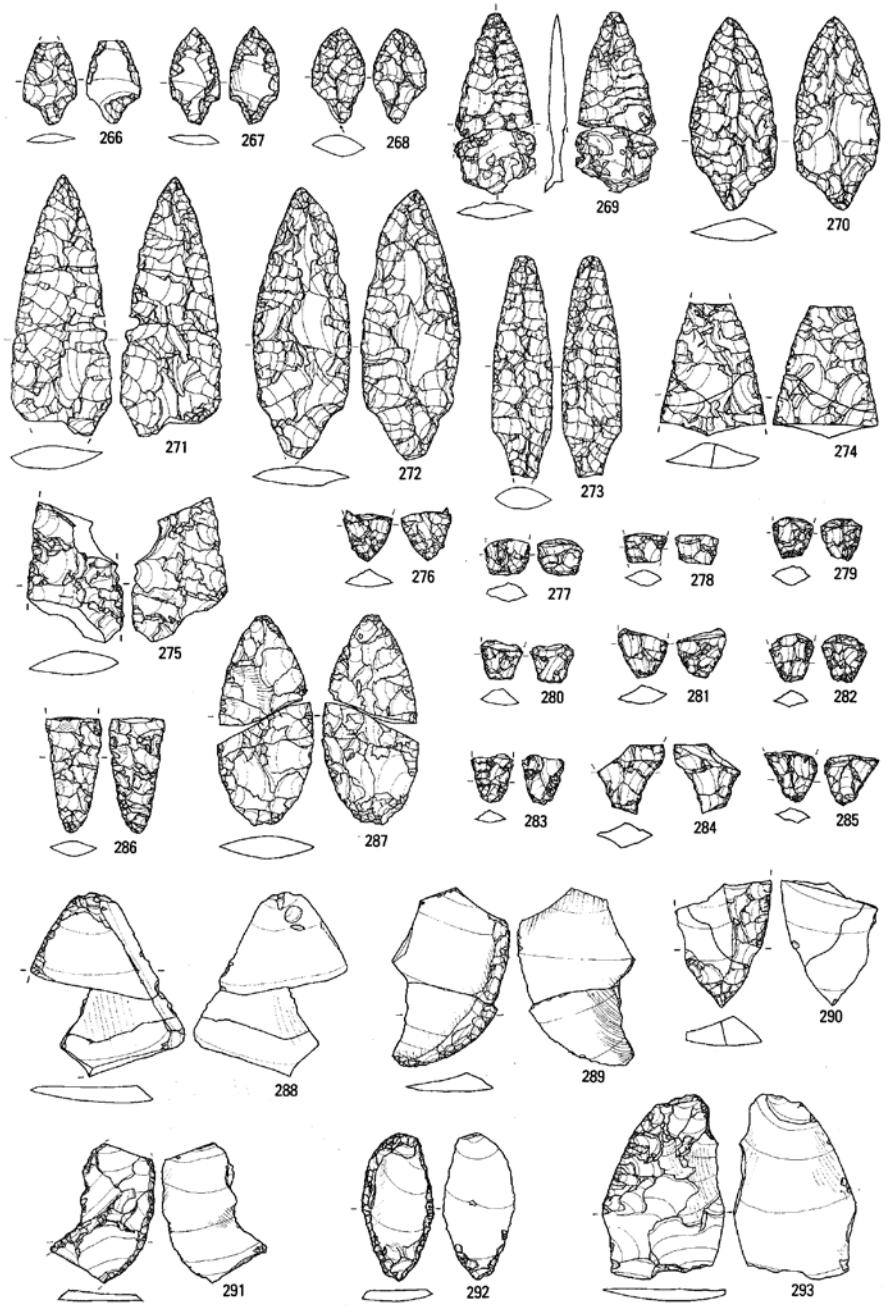


図60　スポット6 (1)


Kamishirataki
Cooper's Ferry
Google Earth
Image Landsat / Copernicus
US Dept of State Geographer
© 2018 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
N
View from Space (Altitude: 10225 km)


Mal'ta
~10,000 km
Cooper's Ferry
~12,600 km
Kamishirataki
Google Earth
Image Landsat / Copernicus
US Dept of State Geographer
© 2018 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
N
View from Space (Altitude: 10225 km)


Kamishirataki
Cooper's Ferry
Kuroshio Current
Google Earth
Image Landsat / Copernicus
US Dept of State Geographer
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N
View from Space (Altitude: 10225 km)

Kam

ooper's Ferry

Google Earth

Image Landsat / Copernicus
US Dept of State Geographer
© 2018 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

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View from Space (Altitude: 10225 km)

Key Points

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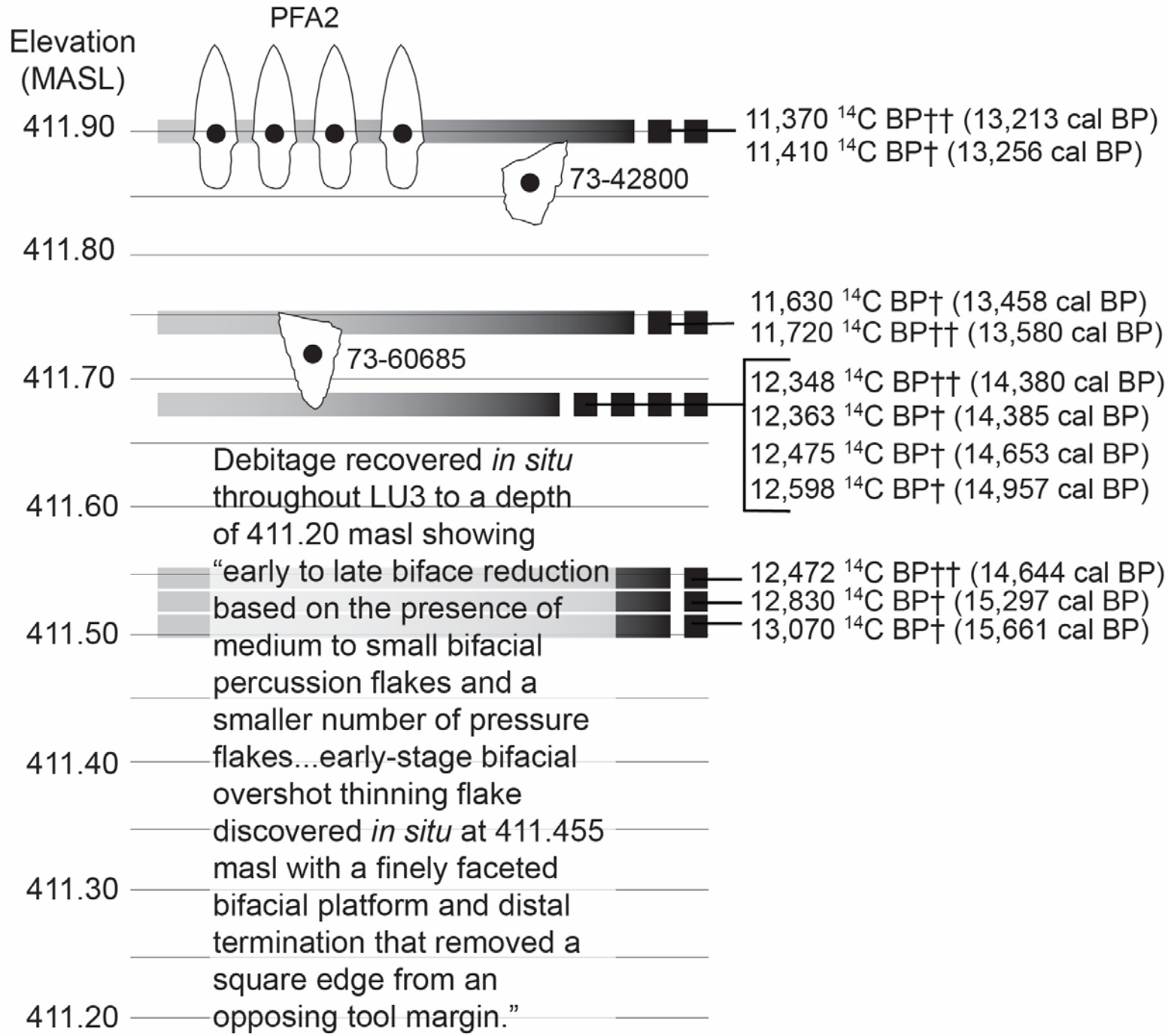
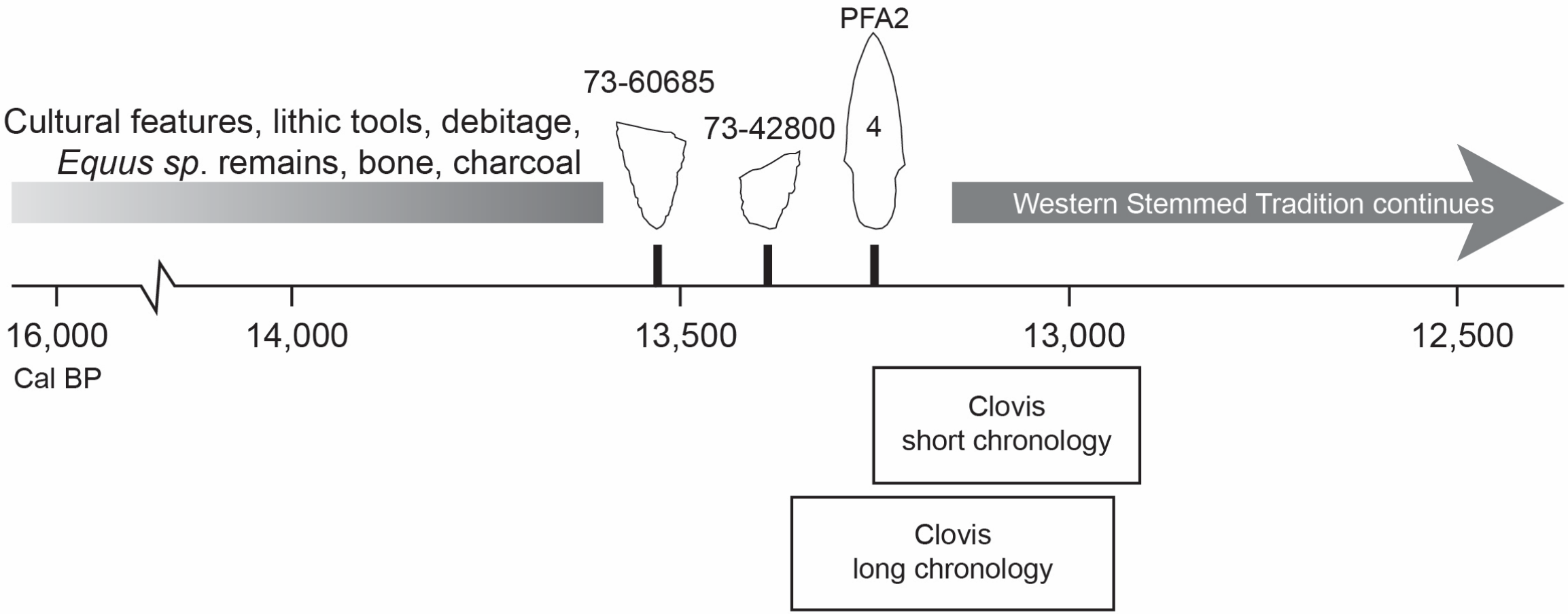

PFA2
Elevation (MASL)
411.90
411.80
411.70
411.60
411.50
411.40
411.30
411.20
73-42800
73-60685
11,370 14C BP†† (13,213 cal BP)
11,410 14C BP† (13,256 cal BP)
11,630 14C BP† (13,458 cal BP)
11,720 14C BP†† (13,580 cal BP)
12,348 14C BP†† (14,380 cal BP)
12,363 14C BP† (14,385 cal BP)
12,475 14C BP† (14,653 cal BP)
12,598 14C BP† (14,957 cal BP)
12,472 14C BP†† (14,644 cal BP)
12,830 14C BP† (15,297 cal BP)
13,070 14C BP† (15,661 cal BP)
Debitage recovered in situ throughout LU3 to a depth of 411.20 masl showing "early to late biface reduction based on the presence of medium to small bifacial percussion flakes and a smaller number of pressure flakes...early-stage bifacial overshot thinning flake discovered in situ at 411.455 masl with a finely faceted bifacial platform and distal termination that removed a square edge from an opposing tool margin."


PFA2
73-60685
73-42800
4
Cultural features, lithic tools, debitage,
Equus sp. remains, bone, charcoal
Western Stemmed Tradition continues
16,000
14,000
13,500
13,000
12,500
Cal BP
Clovis
short chronology
Clovis
long chronology

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- Conclude that humans migrated into the Americas via a Pacific coastal route
- To find more of this early evidence, we must figure out where DORA exists in modern landscapes; CF is deeply buried and other sites might be too

Research Support

- Bernice Peltier Huber Charitable Trust
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